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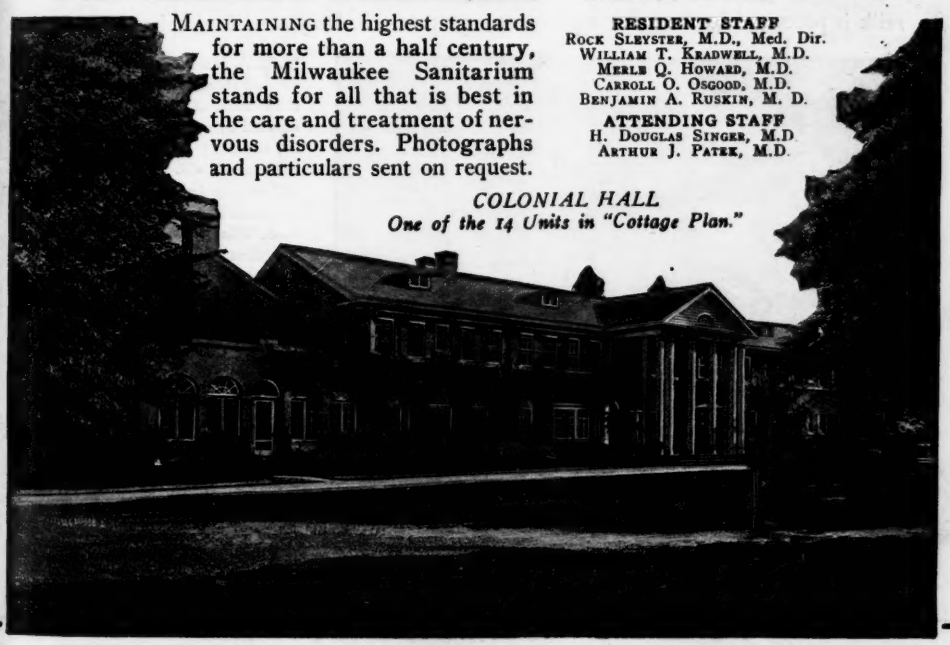

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ILLINOIS MEDICAL JOURNAL

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Editorials

EARLY RECOGNITION AND TREATMENT OF POLIOMYELITIS

Poliomyelitis, like the poor, we have always with us. So, too, is the theory that with poliomyelitis, as with smallpox, "the ounce of prevention is worth the pound of cure" as demonstrated by inoculative immunization. Results still stop at the point equivocal.

Early diagnosis is admitted the first step toward cure of any disease, and from the start such a finding has been recognized as of maximum assistance in the prevention of the paralysis of poliomyelitis, since in a large percentage of cases a diagnosis of poliomyelitis can be established days prior to the onset of paralysis. It has never been satisfactorily established as to what is the actual value and efficacy of convalescent serum in acute poliomyelitis. F. W. Laidlaw in his "Poliomyelitis in the State of New York in 1931" has stated that in 55% of the cases diagnosis was made during the preparalytic stage, and the case for serum remained wide open.

Communiques as to serum and its work are frequent, variable and almost unanimously inconclusive. Advocacy for serum seems to be gaining strength.

Indeed, reports from many quarters are to the effect that determined effort *becomes more strenuous for the development of an active method of immunization against poliomyelitis.* This would indicate revival of hope in the clinical attitude towards a disease condition by unknown and uncontrollable host factors. But since such an achievement is still problematical, it behooves the profession at large to refuse to discard the disputed values of convalescent serum in treatment of the disease. Truly enough the case for this form of biologic therapy has as yet to be made, all argument to the contrary, withstanding. But that the procedure is far from useless may well be gathered from experiences in Denmark as cited in the article by Claus Jensen, in the Proceedings of the "Royal Society of Medi-

cine" for 1935, page 1007. These commented on experiences collected during the 1934 epidemic in Denmark. At that time about 4,500 cases in both the paralytic and the preparalytic stage were hospitalized. In November, 1934, a committee was appointed to make an investigation and a report which was published later in the *"Ugeskrift for Laeger,"* Volume 97, pages 837-841, 1935.

Epitomizing the findings of this Danish Commission let it be connoted that the recommendations were hospitalization as soon as is possible, with prompt serum treatment and a residence of at least three weeks in the hospital. The average dose recommended was one cubic centimeter per kilogram of body weight, with emphatic prescription that repetition of this injection, and if necessary, a larger dose, is imperative on the slightest sign of progress of the disease.

Donors of the serum were abortive, aparalytic and paralytic cases of poliomyelitis. The abortive cases were bled on the thirteenth day after the onset of the disease; the aparalytics, on the twenty-sixth day, and the paralytics on the twenty-ninth day. Some 80% of the patients admitted to the hospital were given treatment by the intravenous or intramuscular route. Usually the serum was reserved for cases aparalytic at the time of administration, and it was admitted that no conclusions could be drawn as to the efficacy of the serum. The table reprinted here from the Danish findings shows that the serum played a significant part in preventing paralysis. It must be noted, too, that though convalescent serum was not used prophylactically, that a concentrated hyperimmune horse serum was used in two soldiers' camps. Results were negative in that no cases occurred in either treated or untreated groups, although one camp had 500 soldiers, each of whom was given five cubic centimeters of the horse serum intramuscularly, and in the other camp only about half the soldiers or 200 were treated.

The poliomyelitis season is again with us. It behooves every physician to exert himself to the utmost to discover prophylactic or at least palliative measures against this dread disease.

Now these findings of Jensen, showing a total incidence of paralysis added to two other recent reports of moment are splendid testimony for the cause of continued use of the serum.

TABLE OF DANISH FINDINGS

Percentage of Paralyses in Relation to the Day on Which 2,992 Patients Were Given Serum

Beginning of the Meningeal Stage Before Treatment	Serum-Treated Cases Number		Cases with Paralysis Number		Per Cent	
Less than 1 day	802	2,367	33	127	4.1	5.36
1 day	913		50		5.5	
2 days	652		44		6.7	
3 days	283	625	48	110	17.0	17.6
4 days	125		15		12.0	
5 days	78		11		14.1	
6 days	50		9		18.0	
More than 6 days	89		27		30.3	
Total	2,992		237		7.9	

In the *Annals of Internal Medicine,* Nov., 1934, Cowie, Parsons and Lowenberg report clinico-pathological observations on 125 acute cases of infantile paralysis that they found no residual paralysis in 80 preparalytic cases treated with human convalescent serum, and transfusions from normal adults. The ILLINOIS MEDICAL JOURNAL on page 296 has an article by S. O. Levinson dealing with a five-year review of anterior poliomyelitis in the Chicago area, in which he observed paralysis in only a few cases, and that disappeared after a few weeks. The decline of acute symptoms in early paralytic cases as well as in the preparalytic group especially impressed Levinson who made his findings from 149 preparalytic cases of the seasonal endemic type in the Chicago area.

Recommendations are for large doses of convalescent serum, (100cc or more) given intravenously, and small doses (10 to 15cc) intraspinally at the time of the spinal puncture. Repetition of the intravenous doses are called for within from 12 to 24 hours if the symptoms are not subsiding or if the temperature is still unduly high. Whether serum treatment is the one specific must yet be proven; so far it has shown the most intrinsic value, even though orthopedic measures must be begun early and kept up vigorously both in cases where only the paresis appears or the acute paralytic disease exists.

There is so much more about poliomyelitis that is unknown than there is that is known. As to penetration of the antibody into the nervous system at any stage of the disease, experimental data is lacking completely. Rous, Peyton, MacMaster and Hudack in the *Journal of Experimental Medicine,* in 1935, held that it was beyond probability that any type of antibody can reach the virus once "virus cell union has taken place, yet that undoubtedly neutralization of virus in

dead cells and virus in transit can take place." So much in the dark is science as to the distribution of the virus in the cord during the preparalytic stage in man, that there may be some effect of antibody in almost any stage.

The effect of the serum on man is different from the effect of serum on monkeys so that experimental data on monkeys cannot be applied to man.

There is a difference in the severity of the disease, and there is difficulty in managing monkeys with acute poliomyelitis. Several authorities admit a partial prophylactic value in the use of the serum on monkeys, however, and something over a twenty per cent reduction in the mortality rate of the monkeys. Probable recovery from paralysis is beyond statistical value. It cannot be estimated until after the first convalescent year. With some patients recovery of muscle strength is not manifested until the second year.

The trend is to give either larger doses of the serum or to secure higher concentration of the serum. It is an admitted fact that from 25 to 60% of poliomyelitic convalescents possess no neutralizing substance against the virus. Some serum centers get away from this by preparing pools of serum from some fifteen to twenty donors. Most potent serums seem to be those produced in animals but they are as yet without benefit to man, as their use is contraindicated by reactions from intraspinal administration. Pooled normal human adult serum, carrying an equal or greater content of neutralizing substances have been proven to be as practical of result as the convalescent serum.

The New York city epidemic of 1931, and another epidemic in Connecticut are still productive of greatest argument among the men handling each of these visitations. Verdict of the New York Academy of Medicine stands: "The results of the study are inconclusive."

YOU WERE TOLD TWENTY YEARS AGO THAT COMMUNISM WAS OUT TO DESTROY MEDICINE

Faced by appalling conditions of lay intervention, political control and governmental interference wreaking havoc that the most nonchalant or insousciant, or stoical or criminally indifferent physician, can no longer evade, or elude or ignore, the "cry from Macedonia" comes loud and clear:

"Why didn't somebody tell us before? Why hasn't the profession been informed of these trends by its leaders, at the smallest signs of the first symptoms?"

In at least two contemporary medical journals within a comparatively short time the question was asked: "Why did not some doctor or doctors foresee and forewarn the profession of the oncoming lay dictation political control of medical practice and general socialization of the healing art?"

To these inquiries or criticisms let the information be handed with emphasis:

"Gentlemen, you were told but you would not listen.

"There are none so blind as those, who having eyes, will not see, nor so deaf as those having ears, who hear not." For over twenty years the columns of the ILLINOIS MEDICAL JOURNAL have preached the doctrine of danger from socialistic sources and sounded the tocsin of alarm. Bound files of the JOURNAL offer black and white testimony to this. There lies the indictment of the printed word. And as further evidence of the fact that Illinois knew and saw and attempted to warn the country of the enemy lurking along the way let reference be made to the present editor of the ILLINOIS MEDICAL JOURNAL, upon assuming the office of president of the Illinois State Medical society at Peoria, Ill., on May 21, 1913."

This address, entitled "Economic Condition of the Profession," read in part:

"In assuming the office of President of this organization it is customary to make a few appropriate remarks which are of some moment to its members.

"It strikes me that one of the most important questions confronting our profession at the present time is that of the economic conditions of the individual members. Economics under present-day conditions is quite as much a medical as a sociological problem. It is not a local problem either but is a burning question the world over and is one that demands solution. Unless this is arrived at the problem means disaster to the individual physician.

"You are cognizant of the fact that the struggle for existence at present is greater than

at any time in the world's history. The physical conditions of the country are not at fault, but our demands have increased through our intellectual development out of all proportions to our physical ability to satisfy them.

"Are you giving this question due consideration? *Remember that we cannot improve our condition as trade unions improve theirs. That is, by increasing their own incomes at the expense of others.* If we wish to improve our own status we must put our shoulders to the wheel and give a helping hand to that general movement which has for its aim the *physical uplift of the medical profession.*

"In this respect are you doing your share of the work? Or are you waiting for the other fellow to do it for you? And, expecting to share in the benefits with him? Unfortunately, there are shirkers in every walk of life. Oh! well, what's the use? The other fellow is willing to take up my task. Let him bear the burden. I will reap the reward.

"Brethren, that's a selfish view of life. Yet, far too many become imbued with that spirit through thoughtlessness, never stopping to consider the duty they owe in conducting mutual affairs. Your interest in this matter is as great as mine. Mine is as great as yours. Therefore it follows that we each should be willing to do our full part for the common good. *On this economic basis rests the immediate and the future well-being of the medical profession.*

"There are two things in the Christian religion that differ from all others: one is its extreme simplicity, the other its universal applicability. The 'Golden Rule' is an epitome of the 'Sermon on the Mount.' It is also the master rule of ethics in our treatment of our fellow men. To say that it is impossible in practice, is absurd.

"Every good citizen makes that precept a rule of his life. Just in so far as he fails to live it, he fails to realize his own ideal. If we, who claim to be fair minded and just, are in doubt as to what we should do to our neighbors; *put ourselves in their place!* Whatever we could expect of a just man under the same circumstances, then that is our plain duty toward him.

"Let us be broad minded enough to look at all sides of men's character. Then we will not be apt to condemn many. 'Smith,' you say, 'is a 'fraud,' and you can prove it. Do not forget that in all probability Smith is saying the same of you, and Smith is as likely to be right as you are. Get together with him and talk over your differences. Perhaps you will find that you both were wrong.

"The many problems confronting us are overcome only by cooperation out of which comes organization to achieve the common goal. The needs and advantages of such cooperation in our profession are obvious. *Mutual support must be our slogan if we are to exist in perpetuity.*

"The doctor who tries to go it alone in the practice of medicine in this day is making a great mistake. The field is so large and the interests involved are so many and so varied, that no one man can keep in touch with them all without constant help from his fellows. On all sides each man is surrounded by difficult problems of which many if not all, can be solved only by cooperation.

"The legitimate practice of medicine has fallen on perilous times. This is evidenced by the writings of eminent men and by the unrest and agitation of the medical profession the world over, due in part to the fact that sanitation and preventive medicine are reducing disease to a negligible quantity; to some extent to the fact that new 'cults' and 'pathies' have cut into the legitimate sphere of the practitioner; but most of all to the encroachment on the work of the physician through unworthily bestowed charity, by our hospitals and dispensaries; to people able to pay. These factors and others all operate to reduce a physician's income.

"Added to all we have the specter of a new ghost, *in the trend of the times toward communistic medicine.* It is my belief that the *practice of medicine, surgery and allied specialties in the not far distant future will become government, state and municipal functions; a fine outlook for the doctor, is it not?*

"This trend is well illustrated by conditions in England where the doctors had to organize finally in sheer defense of their own means of existence. However, in England, establishing methods of defense was deferred too long. So, in spite of the belated protests of the profession, there was foisted on it the obnoxious national insurance act.

"Shall we in America procrastinate in this

matter the same as was done in England, or shall we take steps now to overcome the evils confronting us? By our silence we play renegade to our own interests.

"I am pleased to note that there is some evidence that the profession is beginning to realize as never before the benefits of organization, not only to individual members but also to the individual in his complex relations. There is considerable evidence that the profession is becoming aroused to the necessity of organizing for something more than purely scientific purposes.

"Cooperation in medical practice is a necessity in the present day. All professional men should be thoroughly acquainted with their rights, privileges and power for safeguarding their own vital interests as well as the interests of the community.

"An organized medical profession in Illinois with its ten thousand members could accomplish much in the way of needed reform and would be able to do much to prevent further encroachments of the evils now threatening to engulf us.

"The watchword of the new administration will be alertness along the lines of organization and cooperation; justice for all practitioners; and a helping hand to the general movement which has for its aim the physical and moral uplift of medicine in the State of Illinois."

Words of prophecy are like the mustard seed. Some fall upon the fertile soil, and others upon the rock. But the profession in Illinois was definitely informed upon that occasion and upon the publication of that speech in the ILLINOIS MEDICAL JOURNAL, and has continued to be informed by hundreds of informative articles from eminent men, since that day as to the designs of politics and communism upon ethical medicine.

Men all over the United States who have failed to read the warning from European experiments with phases of communistic medicine, such as panel practice, state medicine and all its evil relatives have had their ears assailed by far-seeing hard-thinking physicians. In the original army of Paul Revere there were several physicians in New York, some in New England, and the two score right here in ILLINOIS to say nothing of several other alert men of scientific training and capable minds, courageous heart and breadth of vision elsewhere. Of the vanguard who led the anti-health insurance, anti-socialistic, anti-state medicine campaign twenty or more years ago at least three of the old guard are at present serving as members of the A. M. A. House of Delegates; they represent three different states in that august body.

Perhaps the profession has gone about it erroneously. After all it was neither sage nor sybil but the cackling of geese that saved Rome. And it must be admitted that with words of prescience and wisdom unheeded the medical profession is well on the way to be destroyed by the cackling of geese—misled theorists caught in the net of communistic hoop-la!

EVERY ETHICAL PHYSICIAN IN THE STATE SHOULD BELONG TO THE ILLINOIS STATE MEDICAL SOCIETY

In numbers there is strength. United we stand, divided we fall. A united medical profession can brush away any and all obstacles. It is next to impossible to find a really successful physician who has obtained fame outside the pale of organized medicine.

Are all the eligible physicians in your county members of your local medical society? If nonmembers of local society are discovered get busy and try to induce them to join at the earliest opportunity.

Doctor, read carefully what a doctor will realize from membership in the Illinois State Medical Society.

The local medical society is the bulwark of the physician.

Money spent in dues for a state or local medical society is one of the safest, surest investments a physician can make.

For the nominal dues of approximately $10.00 a man gets medico-legal protection and his fellowship in the society of his confreres, as well as eligibility to membership in the American Medical Association.

The dues vary in the respective counties, from $7.00 downstate to $10.00 in Cook County per year, depending upon the local activities of the county society in which you reside. Illustrative of the benefits secured from such affiliation rate the following:

1. For approximately $10.00 per year you get medico-legal protection; membership in your

County and Illinois State Medical Societies and the ILLINOIS MEDICAL JOURNAL. Membership in the above makes you eligible also to fellowship in the American Medical Association. Affiliation and association with this large, representative body of men is of great value and importance to every physician.

2. Medical Defense. Out of your annual dues paid, the trustees of the State Medical Society are required to turn $1.50 over to the "medical defense committee" for the protection and defense of members of the society against whom suits for malpractice or damages may be brought. For years the Illinois State Medical Society has been meeting all expenses of such litigation; that is, court costs, attorney's fees, costs of appeals, witness fees, the cost of record —no limitation being placed on this sort of expense of an individual case.

This means that if you become a member of the Illinois State Medical Society you will be defended in every effective manner possible against suits for damages for alleged malpractice, as well as attempted blackmail. This one feature alone is worth many times the cost of membership. Private defense companies are charging $20.00 to $75.00 per year and upwards for the defense and indemnity.

Medical Legislation. Also $1.00 is set aside for a fund to be used by the Legislative Committee for the purpose of combating vicious legislation.

Members of the Illinois State Medical Society are also eligible to membership in any or all of the various affiliated special medical societies in Illinois.

3. Membership in the Illinois State Medical Society. All members of any county Medical Society are *ipso facto* members of the Illinois State Medical Society and will receive all publications of the State Society without any additional fees, dues or subscriptions.

Memberships in the state and local society are necessary before you can affiliate with the reputable professional societies of the country and the American Medical Association. In some states a year's membership in the local society is required before they can secure a license by examination or reciprocity.

4. The Journal of the Illinois State Medical Society. This Journal, owned and published monthly by the medical profession of Illinois, is sent free to each member. The official organ of the Illinois State Medical Society, one of the largest and most influential state organizations in the country, it is among the most comprehensive state medical journals, both in point of circulation and editorial scope. It ranks highly, both in size and in influence, with all medical journals. *Further, in the fight against economic evils oppressing the medical profession, the* ILLINOIS MEDICAL JOURNAL *has been not only a leader, but ever a pioneer.* In the Journal is printed the proceedings of the Illinois State Medical Society; the papers presented at the Chicago Medical Society, which is the largest local medical society in the world. The Chicago Medical Society meets every week, and it has fifteen branches, proceedings of which also are printed in the ILLINOIS MEDICAL JOURNAL, as well as of eleven affiliated societies, namely: Gynecological, Pathological, Ophthalmological, Surgical, Urological, Laryngological and Otological; Orthopedic, Pediatric, Neurological, Roentgen Ray, Medical Legal. On the programs of these various societies appear from time to time a great many of the most eminent men of America and Europe. In the Journal also is published the papers read and the reports of all meetings of the respective county society meetings throughout the state, as well as all the news of interest to medical men in Illinois and throughout the United States. The price of the Journal for non-members is $3.00 per year. It is sent to all members of the Illinois State Medical Society, as one of the perquisites of membership.

5. Reformation of Medical Conditions. Many reforms are being carried on which in previous years were impossible. A few years ago the Medical Legislation Committee of the Illinois State Medical Society succeeded in having passed by the Illinois State Legislature what is considered the best medical practice act in the United States. This Society has a representative as chairman of the committee in Springfield, and the committee is working to the good advantage of medicine in this State. The committee is receiving financial support from the State Medical Society as necessity requires. Every year different cults and branches of so-called medicine try to have special laws passed which will license them

through examinations which do not conform to the medical practice act. It is only through large membership, financial and moral support that this type of legislation can be controlled.

Abuse of medical charities, illegitimate and unethical methods of practice, and all the other evils which have embarrassed the physician and reduced his income can only be successfully handled by a well organized and compact profession, able to take a positive stand on these matters and to carry out its decisions. There is in view (under thorough organization) relief from many of our present difficulties. There never will be devised a patent mechanism which will relieve the doctor of participations in our political activities. Physicians must govern themselves or they will be misgoverned.

6. Eligibility to Fellowship in the American Medical Association. The only way in which a physician can become a member of the State or National organization is through the local society of the County in which he lives. The advantages and privileges to be gained through membership in this great association need not be enlarged upon. Fellowship in the American Medical Association includes The Journal of the American Medical Association, the greatest weekly medical journal published in the United States.

7. Regulation of Pharmaceutical Preparations. The American Medical Association has established a committee, known as the Council on Pharmacy and Chemistry, for the purpose of examining, analyzing and reporting from time to time to the profession its findings on the most important proprietary preparations, such as the general practitioner is constantly being importuned to buy and prescribe for his patients. This movement, which is of vital importance to every practicing physician, deserves the support of all members of the profession, regardless of society affiliations. By becoming a member of your local society you will come more closely in touch with organized and systematic efforts for the uplift and benefit of the profession at large.

8. The Completion of Medical Organization in Illinois. The Illinois State Medical Society today comprises three-fourths of the reputable members in the State. It is to the interest of every physician in Illinois to complete and strengthen this organized and concerted movement on the part of the profession for the betterment of local conditions. The supression of quackery, the prevention of enactment of vicious legislation, and the consummation of other needed reforms can only be accomplished by complete and thorough organization and unanimity on the part of the profession of the State. In this work the support and cooperation of every reputable physician is requested.

The welfare of your profession depends upon the support you give it. A well-organized profession means greater respect and better compensation.

The Illinois State Medical Society desires your support and cooperation. Go to the next meeting of your local or county society and meet the other physicians of your neighborhood. Ask one of the officers of the society for an application blank, fill out the blank, either send or, better, hand it to the President or Secretary, together with the fee for membership in your county society, and thus secure membership in the organized profession of the state and participate in the benefits and privileges of medical organization.

Qualifications for Membership. Every registered physician residing in any county who is of good moral and professional standing and who does not claim to practice any exclusive system of medicine, shall be eligible for membership.

NEW YORK STATE JOURNAL OF MEDICINE WARNS PHYSICIANS TO PREPARE TO COMBAT A FLOOD OF PROPAGANDA TO FOIST COMPULSORY HEALTH INSURANCE ON THE PUBLIC

The Public Relations Bureau of the medical society of the State of New York under date of August 31 released for publication in the daily newspapers the following information:

NEW YORK, Aug. 30.—A warning will be issued to 15,000 members of the New York State Medical Society in the forthcoming issue of the *New York State Journal of Medicine,* urging them to prepare to combat a flood of propaganda to foist compulsory health insurance on the public.

American promoters of European systems of state medicine have been "ominously quiet" re-

cently, an editorial in the Journal will say. The "lull before the storm" will be followed by an inundation of the press of the country with "articles and books to persuade the public to accept cheap medical service in lieu of adequate wages to buy good medical care," according to the Journal.

"Oracles of various phases of social security will tempt the younger medical men with a definite financial return in exchange for the intellectual adventure of working out a career; to exchange the medical development of the individualistic doctor for a job as paid government agent with skill in departmental diplomacy to hold his job; to exchange patients in whom the doctor is interested for public charges who are just so much income and nothing more."

The Journal will emphasize the fact that the medical society is not in partisan politics. "Each member," the Journal will say, "belongs to the political party of his own choice and votes for whatever ticket he pleases. But we should be prepared to resist the flood of propaganda which is coming, from various sources, and sponsored by social theorists."

The first of these efforts to appear, according to the Journal, is a recently published book on the subject of health insurance by Dr. I. S. Falk, health consultant to President Roosevelt's Committee on Social Security.

"That not one country which has tried health insurance has given it up, is not unequivocal," the Journal will state. "Under health insurance schemes as they work out in Europe, the lay personnel exceeds the medical in ratios of from three to five to one. Grover Cleveland invented a phrase which applies here: 'The cohesive force of public plunder.'

"Is it conceivable that a machine, numbering many thousands, the majority of whom would be non-medical, could anywhere so far forget self-interest—interest in the payroll—to take steps to abolish their political jobs? Anyone who thinks will know why no country, once having established this kind of political bureaucracy, could ever break away from it.

"The campaign of 'adult education' has only started. We seem to see the ripple on the calm water which precedes the wind which will soon be upon us. Time to make everything snug and prepare to ride it out."

LET THE GOVERNMENT DO THIS: THE PEOPLE WILL ASSUREDLY DO THE REST

To be a great historian involves being more or less of a prophet. Thomas Babington Macaulay, one of the greatest of Englishmen with this inner vision wrote a century ago that:

"Our Rulers will Best Promote the Improvement of the People by Strictly Confining Themselves to Their Own Legitimate Duties; by Leaving Capital to Find Its Most Lucrative Course; Commodities Their Fair Price; Industry and Intelligence Their Natural Reward, Idleness and Folly Their Natural Punishment; by Maintaining Peace, by Defending Property, by Diminishing the Price of Law and by Observing Strict Economy in Every Department of the State. *Let the government do this: the people will assuredly do the rest.*"

And again: "That is the best government which desires to make the people happy, and knows how to make them happy."

And yet again: "Nothing is so galling to a people, not broken in from birth, *as a paternal or, in other words, a meddling government;* a government which tells them what to read and say and eat and drink and wear."

Undoubtedly we are an unfortunate nation that Macaulay was not born in 1900 A. D. rather than 1800 A. D. and that he could not have run his appointed course of fifty-nine earthly years in this twentieth rather than that nineteenth century in which his sound sense, his phillipics, his ability to grasp the external angles of a situation made him such a monarch of mass thought. Were Macaulay alive today surely he would add to the paragraph above, "or its men of science how to dance like puppets at the end of strings held in the hands of a laity dominated by ignorance, demagogery, cheap politics and insane chimerical theories."

Undoubtedly, too, if Macaulay were writing as of current date he would make further addition of the sentiment:

"Let the lay boondogglers, foundations, socializers and wildfire meddlers leave the practice of medicine to medically trained men."

Macaulay is known to every schoolboy by his "Lays of Ancient Rome," which in heroic ballad form depict causes contributive to the rise and fall of that mighty empire. The nineteenth cen-

tury had its Macaulay, the twentieth century seems to have none. But perhaps the twentieth century, if the boondoggling flood is not impeded, will know a second Macaulay who will find fame and possibly fortune by penning "Lays of What Was Once the World's Greatest Democracy."

INFECTIVITY OF SPINAL FLUID IN LYMPHOGRANULOMA INGUINALE

On the basis of their own clinical and experimental observations and of data available in the literature, Emmerich von Haam and Rigney D'Aunoy, New Orleans (*Journal A. M. A.*, May 9, 1936), conclude that there is much evidence at least suggestive of frequent generalized dissemination of the virus during the early stages of the disease. Coutts takes a similar point of view and even goes so far as to divide the disease into three distinct periods or stages similar to those noted during the evolution of syphilis. According to him, the time elapsing between infection and the appearance of the primary lesion must be regarded as the primary incubation period and may extend up to three weeks. This is followed by a secondary period characterized by the appearance of constitutional symptoms, inguinal buboes and occasionally generalized lymphadenitis, skin lesions, conjunctival lesions and anemia. Lesions of the tertiary period are elephantiasis of the genital organs, ulceration of the vulva (esthiomene) and rectal stricture. Although the authors are inclined to consider the conclusions of Coutss premature on the basis of the available clinical observations on the various manifestations of the disease, they cannot deny that such a concept may yet prove correct. Their successful demonstration of the virus in the spinal fluid of infected patents certainly proves that dissemination of the virus in the human body actually occurs. Study of the spinal fluid in a large number of cases alone will prove whether this reported observation must be regarded as the rule or as an exception during the course of the disease. Even should the latter prove true, the observations give a firmer basis to the incrimination of the virus as the causal agent of the cerebral manifestations occurring during the course of inguinal lymphogranuloma, as described in increasing frequency by continental workers.

INDUCED HYPERCALCEMIA: ITS POSSIBLE THERAPEUTIC RELATION TO THROMBOCYTOPENIC PURPURA

Harry Lowenburg, Sr., and Theodore M. Ginsburg, Philadelphia (*Journal A. M. A.*, May 23, 1936), observed a second case of acute hypercalcemia produced by intentional overdosage with parathyroid extract in a boy with thrombocytopenic purpura. Toxic symptoms occurring in man are similar to those reported by many workers as occurring in animals with experimental hypercalcemia. The earliest symptom is vomiting. This is shortly followed by weakness, apathy and lethargy. Both patients, once hypercalcemia was established, presented definite objective changes in the blood (bleeding time, clotting time, clot retraction, platelet count) as well as clinical cure. The treatment of thrombocytopenic purpura by the induction of artificial hypercalcemia by the use of large doses of parathyroid extract is at least worthy of trial. Calcium gluconate was used to protect the bones from the withdrawal of calcium from them into the blood. As compared with other forms of treatment, one would seem to have nothing to lose. On the assumption that the apparent cures were obtained as the result of the treatment administered, no explanation is apparent to account for the results.

POST-TRAUMATIC NARCOLEPSY

George W. Hall and George B. LeRoy, Chicago (*Journal A. M. A.*, Feb. 8, 1936), point out that early writers regarded the syndrome of somnolence and cataplexy as a neurosis, while more recent observers believe that actual pathologic changes are present. The majority of the post-traumatic cases have been reported since the war. It is questionable whether some cases are the sequel of trauma or of encephalitis. Osnato and Giliberti have shown how the diffuse parenchymatous degeneration of the brain following head injury may closely resemble the lesion of encephalitis, of whatever cause. They have also demonstrated a similarity in the symptomatology of the early stages of head injury and the early phases of an acute encephalitis and have shown statistically the frequency of somnolence in the two cases. The authors divide cases of narcolepsy into two groups. Group 1 includes those presenting diurnal attacks of sleep and cataplexy as described by Gélineau. The term true narcolepsy is therefore limited to this group. Group 2 includes cases presenting pathologic and paroxysmal attacks of somnolence only. The majority of the cases discussed by them are typified by the close relationship between the time of the head trauma and the onset of pathologic and paroxysmal attacks of diurnal sleep. The investigation of cases of post-traumatic narcolepsy renews interest in the etiology of the so-called idiopathic types of narcolepsy, for in the cases considered, the exciting cause is rather obvious and one can speculate with some degree of certainty on the changes in the brain. At the same time one cannot ignore the part that epidemic encephalitis or some other inflammatory disease of the thypothalamic region plays as a cause of narcolepsy, as it is an obvious fact, which must not be overlooked, that narcolepsy with cataplexy is rarely the sequel of head injury, which is a rather common accident.

DANGEROUS DAN M'CROBE

A bunch of germs were hitting it up
In the bronchial saloon;
Two bugs in the edge of the larynx
Were jazzing a ragtime tune.
Back in the teeth, in a solo game,
Sat dangerous Ack-Kerchoo;
And watching his pulse was his light of love,
The lady who's known as Flu.

—*Sundial.*

MEDICAL ECONOMICS

Frank L. Brown, M. D.
E. P. Coleman, M. D.
John R. Neal, M. D.
Ralph Peairs, M. D.
P. H. Kreuscher, M. D.
C. E. Wilkinson, M. D.

Edited by the Committee on Medical Economics
of the
Illinois State Medical Society
E. S. Hamilton, M. D., Chairman
Kankakee, Illinois
Address all letters and commnications to the Chairman.

H. M. Camp, M. D.
R. L. Green, M. D.
I. H. Neece
R. K. Packard, M. D.
C. B. Reed, M. D.
C. S. Skaggs, M. D.

The return of the care of the poor to the township supervisor has resulted in renewed interest in the problem of how the medical care should be furnished. The old method of a township physician, who furnishes all care at either reduced fees or for a fixed salary, no longer satisfies either the recipients of the care, who have been accustomed to free choice of doctors under the Illinois Emergency Relief plan and desire to continue to enjoy that privilege, or to supervisor in charge, who is constantly importuned for some doctor, other than the regular one. Incidentally, the medical profession itself is not well pleased with this method, which it views with suspicion as a further advance of Socialized Medicine. As a result considerable interest has been shown in the so-called Waterloo plan of furnishing care for the indigent. This plan, first used in Waterloo, Iowa, from which its name was received, has been in use with great satisfaction, over twenty years. The plan has been in use in different cities and communities in Illinois with uniform satisfaction to all concerned for many years. An effort will be made to outline the plan as used successfully in one of the cities and then comment on the advantages and shortcomings of the plan.

The success of the plan is dependent on a cooperative medical society. Those men, who agree to furnish this service, are divided into groups, each of which should contain an oculist, a surgeon and as many general practitioners as are available and necessary to furnish adequate service to the indigent. These groups work either two or three months at a time and are then off the panel for the rest of the year. The secretary of the society furnishes the overseer of the poor a list of the men on the panel as well as a permanent list of all men in the plan. When an indigent presents itself for treatment, the overseer asks if he has any particular choice as to a doctor. If he has and that name is on the permanent list, the patient is sent to the physician of his choice. If he has no choice, he is assigned one of the men on the panel. The patient is then cared for exactly as a private patient, the physician using his best judgment as to number and frequency of treatments. Of course, it is fundamental that the service rendered must be of the highest grade and given cheerfully and promptly. The pay for the above service is usually on a flat monthly salary, and the money received is according to a contract entered into by the participating physicians and the supervisor. The money goes into the treasury of the medical group, to be spent as they see fit. More will be said about this later.

The contract entered into between the participating physicians and the supervisor provides for a fixed salary per month for the regular work with extra pay for surgery, major and minor, as well as for obstetrical work. The fees for the extra work are at a reduced rate about the same as that paid by the IERC. These fees also go into the treasury of the medical group, to be expended as they see fit. You will note that no money is handled by the individual physician. All bills are rendered by the secretary of the medical group and all moneys received are placed in the general fund.

A monthly report is made to the secretary of all services rendered by each individual member of the group and he uses these reports to determine the volume of work done under the contract, which can be adjusted to conditions according to the need of the indigent.

Service under this plan has been satisfactory to both the patients and the supervisor. The patients like it because they can get the physician of their choice and are not made to feel that they are on relief as they would feel when this choice is denied them. Supervisors like it for the same reason, choice of physician by the patient often makes the difference between a satisfied and dissatisfied client. In most places that the plan has been in operation the medical profession has

been well pleased. The more nearly the participation of the medical profession of the community is to 100 per cent the better the plan works and the less is the complaint. It is added proof of the well-known fact that the more we mingle with our medical brethren, the better we get along and the higher regard we have for him and his accomplishments. Frequent meetings, best non-scientific and more social, give an opportunity to know one another better and establish personal friendships, which are of great value to the medical profession.

The moneys received for the services so rendered are used in various ways in different places. In some a club room and library are maintained with facilities for meetings and social gatherings. In addition, the dues to the County Medical Society, subscriptions to the J. A. M. A., premiums on malpractice insurance policies and various other benefits to the individuals are paid as the society may agree upon.

The plan has been very successful in practically every community in which it has been tried and the fact it is so uniformly successful, makes it quite evident that the plan is of merit.

Further information as to the manner of conducting the plan can be obtained from the secretary of the society where the plan is in operation. Inquiry to the Chairman of this Committee will be promptly answered with the desired information.

The attention of the medical profession is directed to an article by President R. L. Green, of Peoria dealing with one of the problems of the medical profession. It is directly following this article and is worthy of your attention and thought.

E. S. HAMILTON,
Chairman Committee on Medical Economics.

COOPERATION

When handed the gavel at Springfield, I said in part our organization was like a ball team—no one man makes a team. One weak member can break it. When every one plays his part we will come out all right. The Society Security Act is a fact.

Dr. Jirka has assured us by word and deed he is more than friendly to our organization under the Act.

The Health Department will divide the State up; then will follow programs for the health officer, nurse, clerk and sanitary engineer. This will be all right while Dr. Jirka remains at the head. When his officers decide to step up the program the Society members must cooperate.

Dr. Parran, the national head, has announced in *Survey Graphic* and *Readers Digest* that "Syphilis" will be his meat course.

Now the average doctor knows syphilis is a great economic loss. If treated early, over a long period of time, it can be cured. Your State Hospitals could be cut in two in ten years of intensive treatment of syphilis. It is not required of the health department to treat your case. It does require you to follow up the case. Tell your patient he may be treated anywhere in the world, by giving him a schedule to follow. Syphilis should be quarantined from travel or exposure until they have had the first course of arsphenamine, at least twelve doses of arsphenamine.

This is one of your economic problems. There is not a man practicing medicine in any of its branches that should not be on the look out for syphilis. It is a great mask for many other things. Do a few more tests on your cases as a matter of routine.

Your patient will appreciate your interest. You will keep the health department out of this field.

You can help cut your State hospitals in two in ten years. You say that's none of your business; well, you help pay the bill. If you could look at the volume report of Department of Welfare for the State of Illinois you would grasp some of the magnitude of this problem. It is ignoring these things that make the social worker want to put medical care on the free list.

Many cripples, delinquents, insane, to say nothing of mental cases outside institutional care, could have been prevented by giving enough care over long enough time.

Get behind this economic problem. Help the local society in their effort at immunization programs. Get in on your local parent-teacher program. No matter what your special line may be—for economics are knocking at the door.

If you do not help guide these movements, you will soon find health units doing it for you.

R. L. GREEN,
President Illinois State Medical Society.

EDUCATIONAL COMMITTEE

June-August, 1936

SPEAKERS BUREAU:

Few clubs hold regular meetings during the summer months, consequently the Committee received a limited number of requests for speakers. Representatives of the Illinois State Medical Society appeared before special meetings of the following:

American Legion Auxiliary—DeKalb
American Legion Auxiliary—Peoria
Douglas-Piatt County Home Bureau
Rotary Clubs
Olivet Institute—Chicago
Quarterly meeting District Rural County Nurses
Lions Club
Summer Round-Up and Health Chairmen Conference of Illinois Congress of Parents and Teachers

A suggested list of subjects for health programs for the coming year was mimeographed and sent to 650 different organizations in the state. Many requests for fall, winter and spring programs have been received and programs scheduled.

NEWSPAPERS

The Committee has furnished the *Chicago Daily News* and the *Tribune* with the Daily Pollen Count and stories on HAY FEVER have been features almost daily in the *Tribune*. The public has become interested in these daily reports as indicated by the many telephone calls which come to the office from hay fever sufferers. The pollen count is furnished by Dr. S. M. Feinberg and Mr. Durham of the Abbott Laboratories and is reported to the newspapers through the office of the Educational Committee.

Letters were sent to newspaper editors in Illinois asking if they would be interested in using the health column furnished by the Committee. Ten papers were added to our list to receive the material regularly, a few papers did not want to receive news items or any material from the Medical Society.

60—Health articles furnished newspapers using monthly service
943—Health articles furnished downstate newspapers
237—Health stories to Chicago and vicinity
36—Articles sent to Arkansas State Medical Society
5—Releases for Calumet Branch, C. M. S.
48—Releases Whiteside County Medical meeting
63—Hancock County releases
34—Bureau County releases

Libraries:

564—Health articles sent to Chicago libraries
1,008—Health articles sent to downstate libraries

Press articles written and approved as follows:

How are you going to spend your vacation
Camping
Learning to Swim
Cleanliness is next to Godliness
Summer follies
Hearing aids for the deafened
Does worry interfere with your digestion
Vitamins—2 articles
German measles
Athletics
Rabies

RADIO:

59—Radio programs were given during the three months over stations WAAF, WJJD, WBBM.

It has been evident for some time that the Committee should make these radio programs more vital, but just how this is going to be done has not yet been determined. In some cities the question and answer period has been acceptable.

During the summer we tried to build up our radio audience and thus maintain our standard with the radio stations. Each week we mimeographed about fifty postal cards for each speaker which he could send to his friends or patients. We found this valuable and we believe a legitimate means of giving publicity to the weekly broadcasts of the Illinois State Medical Society. Each speaker received the same number of cards and the form of announcement was the same each week—see following sample—

EDUCATIONAL COMMITTEE—ILLINOIS STATE MEDICAL SOCIETY

Sponsors Radio Health Talks (Eastern Standard Time)

TUESDAYS:

10.00 A. M.—WJJD—Sept. 1.—Dr. Felix Jansey—"Foot Sore & Weary."

12:00 M.—WBBM—Sept. 1—Dr. Arthur Byfield—"Getting Along with Your Heart."

3:15 P. M.—WAAF—Sept. 1—Dr. J. S. Schriver—"Health Check Up For Children."

THURSDAYS:

10:00 A. M.—WJJD—Sept. 3—Dr. H. E. Davis—"Why an X-ray Specialist."

FRIDAYS:

3:15 P. M.—WAAF—Sept 4—Dr. Kenneth K. Jones—"Pellagra."

YOU ARE INVITED TO LISTEN IN EACH WEEK!

MARSHALL FIELD & CO. ANNEX BUILDING WINDOW DISPLAY:

The window display at the Marshall Field & Co. Annex Building has aroused interest. The first exhibit was on Fourth of July accidents and eye injuries, furnished by Doctors T. D. Allen and Glen Nethercut. The second exhibit loaned by the University of Illinois College of Medicine is a figure showing the circulatory system (this model was in the University's exhibit at the Century of Progress). When it is removed from the window it is to be set up in the employees rooms of the Retail Store where it will be viewed by approximately 9,000 employees.

Plans are now being made for exhibits on Cancer, Heart, Feet. It is the hope of the Committee to change the exhibit about every four weeks.

Marshall Field & Co. are donating this window to

the Medical Society and their own decorator is setting up the displays furnished by the Committee.

SOCIALIZED MEDICINE:

Copies of Dr. Reed's Presidential Address were mailed to libraries, presidents of women's clubs, medical libraries and others requesting material on the subject of state medicine.

A number of radio talks on medical economics were given during the summer.

Material on state medicine was sent to both laymen and physicians.

MISCELLANEOUS:

Doctors R. R. Ferguson and R. K. Packard have been invited to serve as Consultants to the Health Committee of the Illinois Congress of Parents and Teachers.

During the summer a letter was sent to the officers of county medical societies advising them that the Committee did not favor baby shows.

SERVICE TO COUNTY MEDICAL SOCIETIES:

215—Notices for Whiteside County Medical Society
40—Notices for Bureau County Medical Society
400—Notices for Hancock County Medical Society, honoring five physicians completing 50 years in practice of medicine.
279—Notices for Randolph County Medical Society
229—Notices for Henry County Medical Society
312—Notices for Lee County Medical Society

SCIENTIFIC SERVICE COMMITTEE:

12—Speakers were scheduled for the summer meetings of:

Bureau County—Dr. Gatewood—New Lamps For Old.

Randolph Co.—Dr. Lee O. Frech—Medical Economics.

McHenry Co.—Dr. C. L. Martin—Proctologic Problems of General Interest.

Christian Co.—Dr. George L. Musgrave—Nasal Accessory Sinuses.

McHenry Co.—Dr. W. B. Serbin—Pathology and Treatment of Procidentia of the Uterus.

Whiteside Co.—M. Herbert Barker—"Treatment of Hypertension with Special Reference to the Cyanates.

Hancock Co.—Dr. DeLee's talking movies on Forceps Delivery.

Hancock Co.—Dr. Clayton J. Lundy—The Heart—movies.

Hancock Co.—Dr. LeRoy H. Sloan—Significant Progress in Medical Diagnosis Applicable to Daily Practice.

Hancock Co.—Dr. George DeTarnowsky—Treatment of Low Back Pain.

McHenry Co.—Dr. Clifford Grulee—Care of Premature Infants.

McHenry Co.—Dr. L. E. Hines—Present Knowledge of Endocardial Infections.

Publicity was given these meetings and notices mimeographed and addressed the members of the societies.

The Scientific Service Committee has added about fifty new names to its list of speakers available for medical society meetings. A copy of this list was sent to all secretaries and presidents of medical societies with a letter telling of the special clinical services available through this Committee.

A number of societies seem to have taken a new lease on life during the last few months and through the combined efforts of the Scientific Service and Educational Committees have had splendid programs with excellent attendance.

Respectfully submitted,
JEAN MCARTHUR, Secretary.

INTERNATIONAL MEDICAL ASSEMBLY INTER-STATE POST GRADUATE MEDICAL ASSOCIATION OF NORTH AMERICA

ST. PAUL, MINN.

OCTOBER 12, 13, 14, 15, 16, 1936

Pre-Assembly Clinics, October 10
Post-Assembly Clinics, October 17
St. Paul Hospitals

Monday, October 12

8:00 A. M.

Diagnostic Clinic: "Coronary Thrombosis and Angina Pectoris." Dr. Fred M. Smith, Professor of Theory and Practice of Medicine, State University of Iowa College of Medicine, Iowa City, Iowa.

Diagnostic Clinic: "Diseases of the Thyroid Gland." Dr. Robert S. Dinsmore, Cleveland Clinic, Cleveland, Ohio.

Diagnostic Clinic: "Rheumatoid Arthritis." Dr. Russell L. Haden, Chief of Medical Division, Cleveland Clinic, Cleveland, Ohio.

Intermission for Review of Exhibits

Diagnostic Clinic: "Trigeminal Neuralgia." Dr. Francis C. Grant, Assistant Professor of Neurological Surgery, University of Pennsylvania School of Medicine, Philadelphia, Pa.

Diagnostic Clinic: "Pathologic Physiology of the Common Bile Duct and Its Relation to Disease of the Biliary Tract." Dr. Waltman Walters, Associate Professor of Surgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

Noon Intermission

1:00 P. M.

Address: "Obstetric Hemorrhages and Their Treatment." Dr. Jennings C. Lutzenberg, Professor of Obstetrics and Gynecology, University of Minnesota Medical School, Minneapolis, Minn.

Address: "Relation of the Endocrine Glands to Sterility." Dr. Emil Novak, Associate Professor of Obstetrics. University of Maryland School of Medicine, Baltimore, Md.

Address: "The Radical Cure of Malignant Tu-

mors of the Bladder." Dr. Hugh H. Young, Professor of Urology, Johns Hopkins University School of Medicine, Baltimore, Md.

Intermission for Review of Exhibits

Address: "Treatment of Diabetes During Surgical Emergencies." Dr. Herman O. Mosenthal, Professor of Clinical Medicine, New York Postgraduate Medical School, New York, N. Y.

Address: "Problems in the Diagnosis of Diabetes." Dr. Robert D. Lawrence, M.A., M.D., F.R.C.P., Physician to Kings College Hospital, Diabetic Department, London, England.

Address: "Neurological Surgery." Dr. Loyal Davis, Professor of Surgery, Northwestern University School of Medicine, Chicago, Illinois.

Dinner Intermission

7:00 P. M.

Address: "Endocrine Disorders in Childhood." Dr. Frederick W. Schlutz, Richard T. Crane Professor of Pediatrics, University of Chicago School of Medicine, Chicago, Ill.

Address: "Peritonitis." Dr. Frederick A. Coller, Professor of Surgery, University of Michigan Medical School, Ann Arbor, Mich.

Address: "Very Recent Advances in Medicine." Dr. Russell M. Wilder, Professor of Medicine, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

Address: "Practical Points in Clinical Surgery." Dr. W. Wayne Babcock, Professor of Surgery and Clinical Surgery, Temple University School of Medicine, Philadelphia, Pa.

Address: "Intravenous Anesthesia." Dr. John S. Lundy, Professor of Anesthesia and Surgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

Tuesday, October 13

8:00 A. M.

Diagnostic Clinic: "Clinical Nutritional Disease (Vitamin B Deficiency)." Dr. Andrew Almon Fletcher, University of Toronto Faculty of Medicine, Toronto, Canada.

Diagnostic Clinic: "Diagnosis and Treatment of Brain Tumors." Dr. Walter E. Dandy, Adjunct Professor of Neurological Surgery, Johns Hopkins University School of Medicine, Baltimore, Md.

Diagnostic Clinic: "The Diagnosis of Bone Lesions." Dr. Dean D. Lewis, Professor of Surgery, Johns Hopkins University School of Medicine, Baltimore, Md.

Intermission for Review of Exhibits

Diagnostic Clinic: "Tumors of the Breast." Dr. John F. Erdmann, Attending Surgeon of the New York Postgraduate Hospital and Medical School, New York, N. Y.

Diagnostic Clinic: "The Psychobiology of the Peptic Ulcer Patient." Dr. George Draper, Associate Professor of Clinical Medicine, Columbia University College of Physicians and Surgeons, New York, N. Y.

Noon Intermission

1:00 P. M.

Diagnostic Clinic: "Treatment and Guidance of Patients with Damaged Hearts." Dr. David Riesman, Professor of Clinical Medicine and Professor of History of Medicine, University of Pennsylvania School of Medicine, Philadelphia, Pa.; President, Inter-State Post Graduate Medical Association.

Address: "The Treatment of Endocervicitis." Dr. Walter T. Dannreuther, Professor of Clinical Gynecology, New York Postgraduate Medical School, New York, N. Y.

Address: "Diffuse Adenomatosis of the Colon." Dr. Fred W. Rankin, Lexington, Kentucky.

Intermission for Review of Exhibits

Address: (Subject to be supplied.) Dr. Francis J. Charteris, M.D., Ch.B., Professor of Materia Medica and Therapeutics, St. Andrews University School of Medicine, St. Andrews, Scotland.

Address: "Factors Frequently Overlooked in the Management of the Patient with Heart Disease." Dr. Charles A. Elliott, Professor of Medicine, Northwestern University School of Medicine, Chicago, Ill.

Address: "The Diagnosis of Intracranial Complications of Aural and Nasal Sinus Suppuration." Dr. Wells P. Eagleton, Oalr., Newark, New Jersey.

Address: "Treatment of Acute and Chronic Mastoiditis." Dr. Matthew S. Ersner, Professor of Otolaryngology, Temple University School of Medicine, Philadelphia, Pa.

Dinner Intermission

7:00 P. M.

Address: "The Consideration and Management of Some of the More Common Congenital Deformities of the Rectum." Dr. Vernon C. David, Clinical Professor of Surgery, Rush Medical College, Chicago, Illinois.

Address: "The Diagnosis and Treatment of Tumors of the Bladder by Means of the Roentgen Rays." Dr. George E. Pfahler, Professor of Radiology, University of Pennsylvania Graduate School of Medicine, Philadelphia, Pa.

Address: "The Cerebral Regulation of Autonomic Function." Dr. John F. Fulton, Sterling Professor of Physiology, Yale University School of Medicine, New Haven, Conn.

Address: "Syphilis of the Heart and Blood Vessels." Dr. Maurice C. Pincoffs, Professor of Medicine, University of Maryland School of Medicine, Baltimore, Md.

Address: "The Management of Intestinal Obstructions." Dr. Owen H. Wangensteen, Professor of Surgery, University of Minnesota Medical School, Minneapolis, Minn.

Wednesday, October 14

8:00 A. M.

Diagnostic Clinic: "Paralyses in Children." Dr. Bronson Crothers, Assistant Professor of Pediatrics, Harvard University Medical School, Boston, Mass.

Diagnostic Clinic: "Carcinoma of the Stomach." Dr. Donald C. Balfour, Professor of Surgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

Diagnostic Clinic: "Economic Advantages of Early Protected Weight-Bearing in Fractures of the Leg, Foot and Ankle." Dr. Fraser B. Gurd, McGill University Faculty of Medicine, Montreal, Canada.

Intermission for Review of Exhibits

Diagnostic Clinic: "Essential Hypertension." Dr. Alfred W. Adson, Professor of Neurosurgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minn., and Dr. E. V. Allen, Assistant Professor of Medicine, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

Diagnostic Clinic: "Bodily Type in Relation to Endocrine Function." Dr. Charles R. Stockard, Professor of Anatomy, Cornell University Medical College, New York, N. Y.

Noon Intermission

1:00 P. M.

Diagnostic Clinic: "The Nature and Management of Nephritis Edema." Dr. Louis H. Newburgh, Professor of Clinical Investigation in Internal Medicine, University of Michigan Medical School, Ann Arbor, Mich.

Address: "Circulatory Failure in Acute Infectious Diseases." Dr. William R. Williams, Professor of Clinical Medicine, Cornell University Medical College, New York, N. Y.

Address: "Genesis and Surgical Treatment of Essential Hypertension." Dr. George Crile, Cleveland Clinic, Cleveland, Ohio.

Intermission for Review of Exhibits

Address: "Relation of Diseases of the Sinuses to Organic Disease." Dr. Robert F. Ridpath, Professor of Laryngology and Rhinology, Temple University School of Medicine, Philadelphia, Pa.

Address: "Intrathoracic Goiter." Dr. Charles G. Heyd, Professor of Clinical Surgery, New York Postgraduate Medical School, New York, N. Y.

Address: "Non-Surgical Diseases of the Colon." Dr. Joseph W. Larimore, Associate Professor of Clinical Medicine, Washington University School of Medicine, St. Louis, Mo.

Address: "The Surgical Anatomy of the Anal Canal" (including methods of Treatment of Fistula-in-Ano). Dr. C. Naunton Morgan, F.R.C.S., Senior Assistant Surgeon to St. Mark's Hospital for diseases of the Rectum; Surgeon to the Hospital for Tropical Diseases; Casualty Surgeon to St. Bartholomew's Hospital, London, England.

ASSEMBLY DINNER

7:00 P. M.

Informal

For members of the profession, their ladies and friends.

Dr. David Riesman, Master of Ceremonies.

Presentation of Token of Appreciation to Dr. Charles H. Mayo and Dr. William J. Mayo, Rochester, Minnesota.

Addresses by eminent members of the profession and other distinguished citizens of the world.

Thursday, October 15

8:00 A. M.

Diagnostic Clinic: "The Relation of the Psychoses to Systemic Diseases." Dr. Earl D. Bond, Professor of Psychiatry, University of Pennsylvania School of Medicine, Philadelphia, Pa.

Diagnostic Clinic: "Indications for Surgery and the Surgical Treatment of Peptic Ulcer." Dr. Frank H. Lahey, Director of Surgery in the Lahey Clinic; Surgeon of the New England Baptist Hospital and New England Deaconess Hospital, Boston, Mass.

Diagnostic Clinic: "The Relation of Endocrine Glands to Circulatory Diseases." Dr. Leonard G. Rowntree, Director, Philadelphia Institute for Medical Research, Philadelphia, Pa.

Intermission for Review of Exhibits

Diagnostic Clinic: "Cryptorchidism." Dr. Hugh Cabot, Professor of Surgery, University of Minnesota Graduate School of Medicine, Rochester, Minn. (Mayo Clinic.)

Diagnostic Clinic: "The Relation of Lumbosacral Joint to Low Back Pain." Dr. Alan DeForest Smith, Clinical Professor of Orthopedic Surgery, Columbia University College of Physicians and Surgeons, New York, N. Y.

Noon Intermission

1:00 P. M.

Address: "Allergic Diseases." Dr. Robert A. Cooke, Assistant Professor of Clinical Medicine, Cornell University Medical College, New York, N. Y.

Address: "Significance of Menorrhagia and Metrorrhagia." Dr. John R. Fraser, Professor of Obstetrics and Gynecology, McGill University Faculty of Medicine, Montreal, Canada.

Address: (Subject to be supplied.) Dr. Charles H. Mayo, Mayo Clinic, Rochester, Minnesota.

Address: "Applications of Cavity Grafting." Mr. Archibald H. McIndoe, M. B., Ch. B. (N. Z.); M. Sc. (Path.); M. S., F. A. C. S.; F. R. C. S. (England), Assistant Plastic Surgeon, Plastic Unit, St. James's Hospital; Consulting Plastic Surgeon, Royal North Staffordshire Infirmary; Chief Assistant Plastic Surgery, St. Bartholomew's Hospital; Sen. Surgeon, Hospital for Tropical Diseases, London, England.

Intermission for Review of Exhibits

Address: "Function and Deformity in Fracture Results." Dr. Eldridge L. Eliason, Professor of Clinical Surgery, University of Pennsylvania School of Medicine, Philadelphia, Pa.

Address: "The Early Diagnosis of Bronchiogenic Carcinoma." Dr. Chevalier Jackson, Professor of Bronchoscopy and Esophagoscopy, Temple University School of Medicine and Dr. Chevalier L. Jackson, Professor of Clinical Bronchosiopy and Esophagocopy, Temple University School of Medicine, Philadelphia, Pa.

Address: "Water Balance in Children." Dr. Samuel Z. Levine, Acting Professor of Pediatrics, Cornell University Medical College, New York, N. Y.

Address: "The Surgery of Acute and Chronic Compression of the Heart." Dr. Claude S. Beck, Associate Professor of Surgery, Western Reserve University School of Medicine, Cleveland, Ohio.

Dinner Intermission

7:00 P. M.

Address: "Ophthalmic Consultations in a General Hospital." The Joseph Schneider Foundation Presentation. Dr. Lawrence T. Post, Professor of Ophthalmology, Washington University School of Medicine, St. Louis, Mo.

Address: "General Therapeutic Methods for the Protection of Patients in the Extremes of Life." Dr. Irving S. Cutter, Dean and Associate Professor of Medicine, Northwestern University Medical School, Chicago, Ill.

Address: "Periodic Health Examination." Dr. Reginald Fitz, Associate Professor of Medicine, Harvard University Medical School, Boston, Mass.

Address: "The Diagnostic Significance of the Respiratory Rate." Dr. Frederick J. Kalteyer, Clinical Professor of Medicine, Jefferson Medical College, Philadelphia, Pa.

Address: "The Sella Turcica." Dr. Eric Oldberg, Professor of Neurology and Neurological Surgery, University of Illinois College of Medicine, Chicago, Ill.

Friday, October 16

8:00 A. M.

Diagnostic Clinic: "The Differential Diagnosis of Pain in the Chest." Dr. John A. Oille, Assistant Professor of Medicine, University of Toronto Faculty of Medicine, Toronto, Canada.

Diagnostic Clinic: "Fracture of the Neck of the Femur: The Problem Fracture." Dr. John J. Moorhead, Professor of Clinical Surgery, New York Postgraduate Medical School, New York, N. Y.

Diagnostic Clinic: "Protamine Insulin." Dr. Elliott P. Joslin, Clinical Professor of Medicine, Harvard University Medical School, Boston, Mass. and Dr. Priscilla White, Boston, Mass.

Intermission for Review of Exhibits

Diagnostic Clinic: "Review of Operative and Non-operative Treatment of Prostatic Obstruction." Dr. William E. Lower, Cleveland Clinic, Cleveland, Ohio.

Address: "The Differential Diagnosis of Chills and Fever." Dr. James H. Means, Jackson Professor of Clinical Medicine, Harvard University Medical School, Boston, Mass.

Noon Intermission

1:00 P. M.

Address: "Diabetes Insipidus." Dr. Elliott C. Cutler, Moseley Professor of Surgery, Harvard University Medical School, Boston, Mass.

Address: "Treatment of the Elderly Chronic Cardiac." Dr. Cary Eggleston, Assistant Professor of Clinical Medicine, Cornell University Medical College, New York, N. Y.

Address: (Subject to be supplied.) Dr. William J. Mayo, Mayo Clinic, Rochester, Minn.

Intermission for Review of Exhibits

Address: "The Applied Physiology of the Sphincter of Oddi." Dr. Andrew C. Ivy, David Professor of Physiology and Professor of Pharmacology, Northwestern University Medical School, Chicago, Ill.

Address: "The Acute Abdomen." Dr. Irvin Abell, Clinical Professor of Surgery, University of Louisville School of Medicine, Louisville, Ky.

Address: "The Role of the Practitioner and the Specialist in the Management of Urinary Tuberculosis." Dr. Joseph F. McCarthy, Professor of Clinical Urology, New York Postgraduate Medical School, New York, N. Y.

THE MISSISSIPPI VALLEY SANATORIUM ASSOCIATION

PEORIA, ILLINOIS

Hotel Pere Marquette

September 24, 25, 26, 1936

President .....Dr. John W. Towey
Vice-President..... Dr. Walter C. Reineking
Secretary-Treasurer .....Dr. D. O. N. Lindberg

X-RAY EXHIBITS

A. Silicosis and Silico-Tuberculosis. Dr. Oscar A. Sander, Milwaukee, Wisconsin.

B. Pulmonary Basal Lesions. Dr. C. C. Birkelo, Roentgenologist, Herman Kiefer Hospital and William H. Maybury Sanatorium, Detroit, Mich.

C. Technical Considerations of the Chest Roentgenogram. Macon County Tuberculosis Sanatorium, Decatur, Illinois, Assisted by Consultation Service, National Tuberculosis Association.

Thursday Morning, September 24, 1936

Dr. John W. Towey, President, Mississippi Valley Sanatorium Association, Powers, Mich., presiding.

9:00 a. m.—Bronchoscopic Observations of Tracheobronchial Obstructions in Tuberculosis. Dr. Warren Wadsworth, Herman Kiefer Hospital, Detroit, Mich.

9:30 a. m.—Bronchiectasis Associated with Tuberculosis. Dr. S. S. Cohen and Dr. Kenneth Phelps, Glen Lake Sanatorium, Oak Terrace, Minn.

10:00 a. m.—Some Pathological Features of Broncho-

genic Carcinoma. Dr. Carl V. Weller, University of Michigan, Ann Arbor, Mich.

10:20 a. m.—Recess.

10:30 a. m.—Pathologico-Roentgenological Demonstration. Dr. Henry S. Willis, Superintendent, Wm. H. Maybury Sanatorium, Northville, Mich., Correlator. (Gross section study will be made of tuberculous lungs and correlative study will be made with x-ray films.) *Clinical*—Dr. J. J. Singer, St. Louis, Mo.; Dr. Frank L. Jennings, Glen Lake Sanatorium, Oak Terrace, Minn.; Dr. Oscar Lotz, Wisconsin Anti-Tuberculosis Association, Milwaukee, Wis.; Dr. Turner, Chicago, Ill. *Pathological*—Dr. Wm. L. Brosium, Detroit, Mich.; Dr. S. A. Levinson, Associate Professor of Pathology and Associate Professor of Medicine, University of Illinois College of Medicine, Chicago, Ill.

12:00 noon—Appointment of Nominating Committee.

Thursday Afternoon, September 24, 1936

Dr. Walter C. Reineking, Vice-President, Mississippi Valley Sanatorium Association, Madison, Wis., presiding.

Symposium: PULMONARY LESIONS OF NON-TUBERCULOUS CHARACTER

2:15 p. m.—(a). Bronchosinusitis. Dr. Ferris Smith, Grand Rapids, Mich.

2:45 p. m.—(b). Some Aspects of Mediastinal Lesions. Dr. J. J. Singer, St. Louis, Mo.

3:15 p. m.—(c). Lobectomy in the Treatment of Basal Pulmonary Lesions. Dr. Cameron Haight, University Hospital, Ann Arbor, Mich.

3:45 p. m.—(d). The Differential Diagnosis of Silicosis and Silico-Tuberculosis. Dr. Oscar A. Sander, Milwaukee, Wis.

4:15 p. m.—Report of Nominating Committee and Election of Officers.

Evening Session, September 25, 1936

7:30 p. m.—X-Ray clinic. Conducted by Dr. Kennon Dunham and Dr. V. V. Norton, Hamilton County Tuberculosis Sanatorium, Cincinnati, Ohio.

Friday Morning, September 25, 1936

Dr. Robinson Bosworth, President, Illinois Tuberculosis Association, Rockford, Ill., presiding, Joint Session of Sanatorium Association and Tuberculosis Conference.

9:00 a. m.—Opportunities for Finding Tuberculosis in Relief Families. Dr. A. A. Pleyte and Metta Bean, Wisconsin Anti-Tuberculosis Association, Milwaukee, Wis.

9:30 a. m.—The Role of the Sanatorium in the Control Program. Dr. Robinson Bosworth, Rockford Municipal Tuberculosis Sanatorium, Rockford, Ill.

10:00 a. m.—Some Considerations of the Latent Period Between Infection and So-Called Adult Disease as Occurring in Childhood up to Adolescence. Dr. J. A. Myers, University of Minnesota, Minneapolis, Minn.

10:45 a. m.—Pulmonary Tuberculosis in Childhood. Dr. Allen K. Krause, Desert Sanatorium, Tucson, Ariz.

11:30 a. m.—Discussion.

Evening Session, September 24, 1936

BANQUET

Address. Dr. Henry Boswell, Sanatorium, Miss.

THE AMERICAN BOARD OF INTERNAL MEDICINE (INC.)

The American Board of Internal Medicine, incorporated February 28, 1936, completed its organization on June 15, 1936. The officers chosen were Walter L. Bierring, M. D., Des Moines, Chairman; Jonathan C. Meakins, M. D., Montreal, Vice-Chairman; and O. H. Perry Pepper, M. D., Philadelphia, Secretary-Treasurer. These officers with the following six members constitute the present membership of the board: David P. Barr, M. D., St. Louis; Reginald Fitz, M. D., Boston; Ernest E. Irons, M. D., Chicago; William S. Middleton, M. D., Madison; John H. Musser, M. D., New Orleans, and G. Gill Richards, M. D., Salt Lake City.

The term of office of each member will be three years, and no member can serve more than two consecutive three year terms.

The organization of the Board is the result of effective effort on the part of the merican College of Physicians in conjunction with the Section on Practice of Medicine of the American Medical Association and these two organizations are represented in the membership of the Board on a five to four ratio respectively.

The American Board of Internal Medicine had previously received the official approval of the two bodies fostering its organization, as well as that of the Advisory Board for Medical Specialties and the Council on Medical Education and Hospitals of the American Medical Association.

The purpose of the Board will be the certification of specialists in the field of internal medicine, and the establishment of qualifications with the required examination procedure for such certification.

While the Board is at present chiefly concerned with the qualification and procedure for certification in the general field of internal medicine, it is intended to inaugurate immediately after July 1, 1937, similar qualification and procedure for additional certification in certain of the more restricted and specialized branches of internal medicine, as gastroenterology, cardiology, metabolic diseases, tuberculosis, allergic diseases, et cetera. Such special certification will be considered only for candidates who have passed at least the written examination required for certification in general internal medicine. The operation of such a plan will require the active participation of co-operation of recognized representatives from each of such special fields of medicine.

Each applicant for admission to the examination in internal medicine will be required to meet the following standards:

General Qualifications:

1. Satisfactory moral and ethical standing in the profession.
2. Membership in the American Medical Association or, by courtesy, membership in such Canadian or other medical societies as are recognized for this purpose by the Council on Medical Education and Hospitals of the American Medical Association. Except as here provided, membership in other societies will not be required.

Professional Standing:

1. Graduation from a medical school of the United States or Canada recognized by the Council on Medical Education and Hospitals of the American Medical Association.
2. Completion of an internship of not less than one year in a hospital approved by the same council.
3. In the case of an applicant whose training has been received outside of the United States and Canada, his credentials must be satisfactory to the Advisory Board for Medical Specialties and the Council on Medical Education and Hospitals of the American Medical Association.

Special Training:

1. Five years must elapse after completion of a year's internship in a hospital approved for interne training before the candidate is eligible for examination.
2. Three years of this period must be devoted to special training in internal medicine. This requirement should include a period of at least several months of graduate work under proper supervision in anatomy, physiology, biochemistry, pathology, bacteriology, or pharmacology, particularly as related to the practice of internal medicine.

   This work may be carried on in any domestic or foreign medical school or laboratory recognized by the Council on Medical Education and Hospitals of the American Medical Association as offering appropriate facilities for this type of postgraduate experience; or it may include a period of at least several months of graduate work under proper supervision in internal medicine or in its restricted and specialized branches in any domestic or foreign hospital, clinic, or dispensary, recognized by the above Council as offering appropriate facilities for this type of postgraduate experience.
3. A period of not less than two years of special practice in the field of internal medicine or in its more restricted and specialized branches.

   The American Board of Internal Medicine does not propose to establish fixed rules for the preliminary training of candidates for certification in this field. Broad general principles for training, however, may be outlined, although such suggestions as are made must, of necessity, be subject to constant changes reflecting the dynamic nature of the specialty.

   A sound knowledge of physiology, biochemistry, pharmacology, anatomy, bacteriology, and pathology, in so far as they apply to disease is regarded as essential for continued progress of the individual who practices internal medicine. The mere factual knowledge of medicine and its basic sciences is not sufficient. The candidate must have had training in their use in furthering his understanding of clinical medicine. This implies practical experience under the guidance of older men who bring to their clinical problems ripe knowledge and critical judgment. Preparation to meet this requirement adequately may be even more difficult to obtain than the so-called scientific training. It may, however, be acquired in the following ways:

   (a) By work in a well-organized hospital outdoor clinic conducted by competent physicians.

   (b) By a prolonged period of resident hospital appointments likewise directed by skilled physicians.

   (c) By a period of training in intimate association with a well-trained and critical physician who has taken the trouble to teach and guide his assistant rather than to require him only to carry out the minor drudgery of a busy practice.
4. The Board does not consider it to the best interests of internal medicine in this country that rigid rules as to where or how the training outlined above is to be obtained. Medical teaching and knowledge are international. The opportunities of all prospective candidates are not the same. Some may have the opportunity of widening their knowledge by a period of study abroad. Others, at the other extreme, may be restricted to a comparatively narrow geographic area and their detailed training must be obtained in short periods scattered over a long time. Although it is laid down that at least five years must elapse between the termination of the first interne year and the time when the candidate is eligible to take the examination, a longer period is advisable. The Board wishes to emphasize that the time and training are but means to an end of acquiring a broadness and depth of knowledge of internal medicine which the candidate must demonstrate to the Board in order to justify it in certifying that he is competent to practice internal medicine as a specialty. The responsibility of acquiring the knowledge as best he may rests with the candidate, while the responsibility of maintaining the standard of knowledge required for certification devolves on the Board.

Method of Examination:

The examination required of candidates for certification as specialties in Internal Medicine will comprise, Part I (written) and Part II (practical or clinical).

Part I. The written examination is to be held simultaneously in different sections of the United States and Canada and will include:

(a) Questions in applied physiology, physiological chemistry, pathology, pharmacology, and the cultural aspects of medicine.

(b) Questions in general internal medicine.

The first written examination will be held in December, 1936, and candidates successful in this written test will be eligible for the first practical or clinical examination which will be conducted by members of the Board near the time for the annual session of the American College of Physicians at St. Louis in April, 1937. The second practical examination will be held at Philadelphia near the time of the annual session of

the American Medical Association in Atlantic City in June, 1937.

The fee for examination is forty dollars which must accompany the application and an additional fee of ten dollars is required when the certificate is issued.

Application blanks and further information can be obtained by addressing the office of the chairman, Walter L. Bierring, M. D., 406 Sixth Avenue, Des Moines, Iowa, U. S. A.

ANNUAL MEETING OF THE MISSIPPIPPI VALLEY MEDICAL SOCIETY

The Second annual meeting of the MISSISSIPPI VALLEY MEDICAL SOCIETY will be held at Burlington, Iowa, Sept. 30, Oct. 1-2. The entire meeting, including the technical and scientific exhibits, will be held on the mezzanine floor of the modern, 300-room Hotel Burlington. There will be morning, afternoon and evening sessios and the complete program has been especially arranged to appeal to the general practitioner.

Among the eminent clinicians who will address the meeting are:

Donald C. Balfour, M. D., LL.D., F. A. C. S., Rochester, Prof. of Surgery, U. of Minn. Graduate S. of M.; Chief Surg., Mayo Clinic.

Arthur Jos. Barsky, D. D. S., M. D., New York City, Adj. Prof. of Plastic Surgery, New York Polyclinic M. S. and Hospital.

George Crile, M. D., LL.D., F. A. C. S., Cleveland, Director Cleveland Clinic Foundation.

Frederick H. Falls, M. S., M. D., F. A. C. S., Chicago, Prof. & Head of Dept. Obstetrics & Gynecology, U. of Ill. College of Med.

Melvin S. Henderson, M. D., F. A. C. S., Rochester, Prof. of Orthopedic Surgery, Univ. of Minn. Graduate School of Medicine.

Richard H. Jaffe, M. S., M. D., Chicago, Prof. of Pathology, Univ. of Chicago & Univ. of Ill. College of Medicine.

Ralph A. Kinsella, A. M., M. D., F. A. C. P., St. Louis, Prof. & Head of Dept. Medicine, St. Louis University School of Medicine.

Raymond W. McNealy, M. D., F. A. C. S., Chicago, Assoc. Prof. of Surgery, Northwestern University Medical School.

Bela Schick, M. D., New York City, Formerly Prof. of Pediatrics, University of Vienna.

Arthur Steindler, M. D., F. A. C. S., Iowa City, Prof. & Head of Dept. Orthopedic Surgery, State Univ. of Iowa, Col. of M.

These men will each give two practical lectures or clinical demonstrations and will be assisted by thirty-three specialists from Illinois, Missouri and Iowa who will conduct a clinical lecture course.

At the annual Banquet on Thursday evening October 1, the following will address the meeting: Dr. Rolland L. Green, Peoria, President of the Illinois Medical Society; Dr. Ross A. Woolsey, St. Louis, President of the Missouri State Medical Assn.; Dr. Prince E. Sawyer, Sioux City, President, Iowa State Medical Society; Rev. Alphonse M. Schwitalla, St. Louis, Dean of St. Louis University School of Medicine and Dr. Bela Schick, of New York City, Discoverer of the "Schick Test."

There will be over sixty lectures, demonstrations, etc., for the full three day session. All ethical physicians are cordially invited to attend. A detailed program may be obtained from Harold Swanberg, M. D., Secretary-Treasurer, 211-224 W. C. U. Building, Quincy, Illinois.

RESOLUTION ON INSURANCE MEDICAL DIRECTORIES

Adopted by the Arkansas Medical Society, April 29, 1936. Presented to the House of Delegates of the American Medical Association May 11; approved by the Judicial Council May 14 and adopted by the House of Delegates of the American Medical Association May 14, 1936.

WHEREAS, certain commercial interests are publishing medical directories, listing physicians by speciality and otherwise, as available for insurance and compensation work, and other professional services, and

WHEREAS, participation by listing in these lay publications merely serves for the profit of the promoters, and is furthermore technically indirect solicitation of patients,

Therefore Be It Resolved, That the Arkansas Medical Society condemns these practices as unethical and forbids its members to continue listing their names in such directories, and

Be It Further Resolved, That the Arkansas Medical Society requests the House of Delegates of the American Medical Association to take similar action."

INSURANCE MEDICAL DIRECTORIES

The attention of our members has been previously called to the activities of these directory publishers. As is often the case, individual physicians felt that they might incur a loss if they removed their names from such directories while other members retained their listing. With this thought in mind, the above resolution has been adopted. The practice of so listing is declared unethical; no individual member may now feel that should he remove his name that another physician will accept that listing. The benefit is direct to these physicians in the fees saved; the loss is etntirely the promoters.

Some idea of the financial gains involved in the publication of these directories may be understood when we state that one directory now on our desk contains the names of approximately 5,000 physicians. Ninety-two Arkansas physicians are listed in the three directories available to THE JOURNAL. The fee charged for listing in this one directory is $15.00 per annum. A liberal estimate of the cost of publication and distribution is $15,000. The balance, $60,000, is presumably divided between the promoter and his solicitors. Verily, a most altruistic motive prompts the publication.

THE DEATH OF SIR HENRY WELLCOME

Sir Henry Wellcome of the well-known firm of Burroughs-Wellcome and Company, manufacturers of fine chemicals died in his 83rd year in London, on July 25th.

Born in 1853 in a log cabin near Almond, Wisconsin, about 125 miles from Milwaukee, he was the son of an itinerant missionary, the Rev. S. C. Wellcome who with his wife, Mary Curtis Wellcome, travelled in a covered wagon in Wisconsin and Minnesota and preached among the Indian settlements.

As a boy of six Sir Henry assisted his uncle, Dr. J. W. B. Wellcome by holding a basin while the wounds were being dressed of Minnesota pioneers who had been in battle with the Indians.

At an early age he began his career as a pharmacist in Rochester, Minnesota, where he worked from 1868 to 1871. It was there that he came under the notice of Dr. William Worrall Mayo, father of Dr. William J. Mayo and Dr. Charles H. Mayo, founders of the internationally famous Mayo Clinic. Sir Henry was a boyhood friend of the Mayo brothers, and this friendship was continued during his life.

EXAMINATIONS FOR APPOINTMENT IN THE MEDICAL CORPS OF THE UNITED STATES NAVY

Competitive examinations for appointment in the Medical Corps of the Navy are held from time to time for graduates of Class "A" Medical schools.

The requirements for appointment in the Medical Corps of the United States Navy provide that the candidate be a citizen of the United States, between 21 and 32 years of age at the time of appointment; that he be a graduate of a Class "A" medical school, and have completed a general interneship of at least one year in a hospital accredited for internes by the American Medical Association and the American College of Surgeons. The interneship required need not be "rotating." A medical, surgical, or other specialized interneship will be accepted if of satisfactory character. He is required to pass a physical and professional examination. The professional examination embraces Anatomy (Surgical), Physiology, Bio-chemistry, Pathology, Bacteriology and Immunology, Pharmacology and Materia Medica, Medicine, Surgery, Obstetrics and Gynecology, Public Health, and Medical Jurisprudence.

The physical examination is thorough, and the candidate is required to certify that he is free from all mental, physical, and constitutional defects.

If the candidate is found to be physically disqualified, his examination is concluded. The physical requirements for candidates comprise the following: Height, between 66 and 76 inches inclusive; robust physique and development; weight, to be proportionate to the age and height group; hearing, normal; acuity of vision, not less than 12/20 in each eye unaided by glasses and capable of correction by the aid of lenses to 20/20; color perception, normal; teeth, not less than 20 vital teeth, of which there must be 4 opposed incisors and 4 opposed molars.

Formal application (in duplicate) should be forwarded to the Bureau of Medicine and Surgery, Navy Department, Washington, D. C., at least one month in advance of the date set for the examination. Examination will be conducted only at the Naval Medical School, Washington, D. C., the Naval Hospital, Great Lakes, Illinois, and the Naval Hospital, Mare Island (San Francisco), California. Approximately ten days will be required for the examination.

The application shall be accompanied by the following certificates:

(a) Letters or certificates from two or more persons of good repute, testifying from personal knowledge to good habits and moral character.

(b) Satisfactory evidence as to citizenship and age. Any one of the following may be considered as satisfactory proof of citizenship:

If native born—(1) A duly verified copy of a public or church record of birth; (2) affidavit, under oath, of the physician, midwife, or other person present at the birth; (3) in cases where neither (1) or (2) can be obtained by the candidate, the affidait of either parent; (4) in cases where the candidate certifies that no one of the above is obtainable, the affidavits (under oath) of two reputable citizens acquainted with him. Each of these affidavits should state the facts within the knowledge of the deponent upon which he bases his statement as to citizenship of the candidate; as for example, that he has known the candidate since birth, that he knew his parents, or that he knew him to be a bona fide voter, as the case may be. If foreign born —(1) Certificate of naturalization, under the seal of the court by which naturalized; (2) certificate of parent during the minority of the candidate, together with the affidavit of a parent that the candidate is the child of the parent whose certificate of naturalization is submitted; (3) in special cases where the candidate certifies that neither (1) nor (2) is obtainable, the affidavits of two reputable citizens acquainted with him. As every naturalization is a matter of record in some court, these affidavits will be accepted only in very exceptional cases and on the understanding that the candidate will later submit a proper certificate of naturalization.

(c) Certificate of graduation in medicine.

(d) Certificate of interneship from a civilian hospital.

(e) A recent photograph (size preferably 5 by 6).

(f) If the candidate has had special hospital service or special education or professional advantages, certificate to this effect, signed by the proper authority, should be forwarded.

The candidate will save unnnecessary correspondence and delay if he will make sure that the necessary credentials, enumerated above, accompany his application.

If the credentials of the candidate are found satisfactory, the Bureau of Medicine and Surgery will recommend that a permit be issued to the candidate to appear before a board of medical examiners and naval examining board for physical and professional exami-

nation. The candidate's credentials will not be returned to him.

Immediately upon accepting a commisison as lieutenant (junior grade) in the Medical Corps of the Navy, the officer receives compensation of $2,699 per year if he has no dependents, and $3,158 per year if he has dependents. A cash allowance at the rate of 8 cents per mile is allowed the newly appointed officer for travel to his first station of duty. No allowance is made for dependents or transportation of household effects of an officer going to his first duty. No allowance will be made for the expenses of candidates appearing for examination. When traveling under orders, by other than Government conveyance, officers of the Navy receive 8 cents a mile to defray the expenses of such travel performed from point to point within the United States, and when so traveling abroad are allowed actual personal expenses, estimated on a basis varying with the rank of the officer, both as regards admissible items of expense and the cost of such items. In case of a permanent change of station, transportation for wife, dependent children, and household effects is furnished.

Newly appointed medical officers will be ordered to duty at a Naval Hospital pending assignment to duty in attendance upon a course of instruction at the Naval Medical School, Washington, D. C. This course begins annually on September 15 and lasts 6½ months. Upon completion of the course, officers will be eligible for sea duty.

After officers have been in the service a sufficient length of time to assure the Bureau of their remaining in the service, have become thoroughly familiar with the duties of a naval medical officer, and have demonstrated their prefessional qualifications, special courses may be authorized at various hospitals and teaching institution to enable the officer to specialize along lines of his choice. Such specialization, however, must be in addition to and not exclusive of the general duties of a medical officer of the Navy.

Officers of the Medical Corps of the Navy are retired from active service at the age of 64 years, and when so retired (or when retired from active service for disability contracted in the line of duty before that age) receives an annual pay for life amounting to three-fourths of the base pay of their grade at the time of retirement.

Medical officers are eligible for promotion under such provisions of law as may be in effect at the time. Increases in compensation are governed both by rank and length of service. For each promotion a physical and professional examination are required.

For further information or application blanks address the Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

Examinations for the Medical Corps, U. S. Navy, will be held December 1, 1936 and in the latter part of May or early June 1937 at the following named places:

(1) U. S. Naval Hospital, Great Lakes, Illinois.

(2) U. S. Naval Medical School, Washington, D. C., and

(3) U. S. Naval Hospital, Mare Island (near San Francisco), California.

It is expected there will be about 25 vacancies available for the first examination.

RATS RESPONSIBLE FOR THE SPREAD OF VARIOUS DISEASES

The following data is being sent out by our local Health Department in the effort to exterminate the rat menace:

A few centuries ago many European and Asiatic countries were devastated by Bubonic Plague, called the "Black Death." Millions of people died. Many people have the mistaken belief that this deadly disease does not exist in the United States. The United States Public Health Service reported the presence of Bubonic Plague in California and now they report its recent spread eastward into the state of Montana. If the further spread of this fearful disease is not promptly checked before it reaches large centers of population its toll will be serious.

This disease is spread by rates and other rodents. Every citizen should realize that the brown rat is very common everywhere in Chicago. These public enemies are ferocious and often attack and bite human beings, particularly little children.

They breed rapidly. They are bold, and are very resistant to weather and disease. They adapt themselves to a wide range of conditions. They destroy millions of dollars worth of food, material and property every year in Chicago. They start many disastrous fires. Rats are filthy, dangerous creatures, and are enemies of man. They serve no known useful purpose, and should be destroyed.

Food and shelter are as essential to rates as to other animals. Well fed rats mature quickly and breed three, four or more times a year and produce from 6 to 17 young in a litter. Females breed when only 4 or 5 months old. Combating the inroads of this dangerous pest requires:

1. Their destruction.
2. Elimination of their feeding and breeding places.

Protect all food from rats. Keep premises clean. Remove accumulations of useless waste material. Pile all needed lumber and material 18 inches above yard or floor levels. Store all garbage in tightly covered impervious containers. Make all buildings, sheds, barns, and coops rat-proof. Fill or seal all rat holes. Organize Rat Eradication campaigns in your community. This is very important for permanent value. The few rats that are bound to escape death during this campaign will quickly repopulate a community unless YOU continue the effective systematic warfare against rats started by this project. Those who do not care to do the exterminating themselves may call upon experienced commercial exterminators, both for temporary and permanent measures.

The bait we are using in this campaign consists of one part red squill to ten parts oatmeal and cornmeal flour, thoroughly mixed. Enough water is added to give it a doughy feel. A few drops of anise oil is also

added to grain mixtures to make the bait more attractive to rats. Papers are cut into four inch squares and a portion of the bait (about the size of a marble) is placed in each of these squares and wrapped similar to candy kisses.

The bait is placed where evidence reveals that rats abound. It is relatively harmless to domestic animals.

We are also using dry bread saturated with red squill extract as bait.

Other very effective raticides are available at many dealers under various trade names. (Their names and addresses may be procured from the telephone directory under the classification "Exterminating.")

BALANCED MEALS TO INCREASE LIFE SPAN

Protective foods should be included in the menu of every man. These foods are particularly rich in vitamins, and you need vitamins to remain in health. The protective foods include leafy vegetables, fruits and milk. Medical and scientific studies have demonstrated that their use aids in warding off disease, and so help to increase the life span.

Leafy vegetables include lettuce, romaine, spinach, kale, cabbage, cauliflower, dandelion greens, turnip and beet tops, celery and endive. Besides these, although not leafy vegetables, string beans and tomatoes are rich in protective substances. Every full meal should include two cooked vegetables as well as a vegetable salad, the latter preferably of raw vegetables such as lettuce, tomatoes, celery and carrots.

Oranges, grapefruit and lemon, in other words, the citrus fruits; bananas, apples, apricots, grapes, plums, pears, canteloupes, figs, pomegrantes are rich in vitamins, especially vitamin C, and should be eaten freely.

Every man should drink at least a pint of milk every day, for milk is the most nearly perfect food known. Dairy products, cheese and butter, also are fine for health. Both milk and cheese are rich in calcium, a mineral which the body must have.—*Health News Service.*

NEW ARSENICAL IN TREATMENT OF SYPHILIS AND TRYPANOSOMIASIS

W. Yorke and F. Murgatoyd, in collaboration with F. Glyn-Hughes, M. O. Lester and A. O. F. Ross in the British Medical Journal, London, May 23, 1936, and abstracted by the A. M. A. as follows:

As a result of examining the trypanocidal activity of a large number of arsenical products, Yorke and Murgatroyd selected sodium succinanilomethylamide-*p*-arsonate for detailed therapeutic trial. In experiments on laboratory animals this compound compared favorably with tryparsamide in that it was found to be rather less toxic and of somewhat greater trypanocidal activity than the latter drug. In man it was well tolerated in weekly amounts of from 2 to 4 Gm. The usual course consisted of the administration of this amount weekly until a total quantity of from 30 to 36 Gm. had been given. A number of patients had several such courses, the total quantity ranging from 66 to 141 Gm., while one patient had an uninterrupted course of 69 Gm., without showing any toxic signs. Apart from occasional nausea and vomiting, the only toxic signs observed were mild arsenical dermatitis in two patients and temporary jaundice in three advanced cases of neurosyphilis after prolonged courses of the drug. Visual disturbances have not been encountered. The drug exhibited the stimulating action associated with tryparsamide and other pentavalent aromatic arsenicals. In contrast with tryparsamide, the new drug exerts a definite action in primary, secondary and tertiary syphilis. In primary syphilis it alone is inadequate since, although the lesion cleared up rapidly, secondary manifestations developed subsequently. When it was combined with bismuth, the effects on primary syphilis seemed to be more permanent, and so far none of the patients treated in this way have relapsed. It has a definite action on tertiary manifestations of syphilis: the lesions disappeared completely in twenty of twenty-five cases. In early neurosyphilis and in tabes it gave satisfactory results. Of eleven patients with Nigerian sleeping sickness treated by a single course, ten became clinically normal and the other was improved. Eight of these patients had pathologic spinal fluids at the time of treatment; in three of them the fluid had become normal after the single course of treatment, in two it had become considerably improved and in one pathologic changes had apparently increased, although clinically the patient had become quite normal; the other two patients, owing to their clinical improvement, did not complete the treatment. In addition, a welfth advanced case, which had failed to react to full courses of tryparsamide and other drugs, improved remarkably after a course of the compound.

LIFE SPAN HAS NOT CHANGED

Men of achievement apparently enjoyed just about the same average length of life two or three thousand years ago as they do today.

Alexander the Great, Persius and Terence died under or just over thirty years of age, reminding us that in modern times also not a few famous men have had their careers cut short by an early death, as was the case with Shelley, Keats, Schubert and others.

All in all, the average age at death of the eminent men of antiquity was 66.7 years, not much different from that of a sample of 82 noted mathematicians of modern times, namely 64.3, and of a sample of 75 poets, namely 64.1 years.

The average age at death of our presidents also is not very widely different, namely 68.4 years for the entire number and 61.7 years for those who held office since the Civil War.

To find this degree of similarity in the average age at death of a fairly typical list of men who became eminent two thousand or more years ago, on the one hand, and those of the very recent past, is prabably to most of us a somewhat unexpected result.—*Metropolitan Statistical Bulletin*—New York.

HEALTH NEWS ITEM

The best ten years of a woman's life lie between 28 and 30.

Original Articles

SARCOMA OF THE UTERUS

WILLIAM T. CARLISLE, M. D.
CHICAGO

In considering sarcoma of the uterus, several truths suggest themselves. The correct preoperative diagnosis is rarely made. (In our group, the diagnosis was correct one time in thirteen cases).

There seems to be a general misconception as to the gravity of the prognosis; although as early as 1894, Williams noted that 40% of the patients recovered. Finally, no notable progress has been made in etiological or diagnostic criteria.

Historically, Lebert, in 1845, was the first to diagnose this tumor by microscopical examination. Mayer made the first report of this tumor to the Berlin Obstetrical Society in 1860. He emphasized that recurrent fibroids mentioned in the literature previous to this time were in all likelihood sarcomata. As early as 1888 Dr. Henry T. Buford reported the results of a vaginal hysterectomy for sarcoma of the uterus to the Chicago Gynecological Society. It is of interest to note that even at that time considerable controversy arose between Drs. Dudley, Jackson, W. W. Jaggard, L. L. McArthur and Franklin L. Martin relative to the accuracy of the pathological diagnosis of sarcoma and the comparative merits of vaginal hysterectomy in the treatment of this growth. J. Whitridge Williams, in 1894, while a graduate student in Berlin, contributed a monograph on sarcoma of the uterus, which for completeness and clarity has no peer. Numerous contributions have been made since that time notably those of Evans, Bunten, Masson, Lynch and others.

Frequency. Sarcoma constitutes about 2% of all uterine tumors or about 5% of the malignant growths. It is most common in the middle aged but may occur at any age. Sarcoma is predominately the malignant tumor in childhood.

Etiology. The etiology of sarcoma is, of course, unknown; however, Cohnheim's theory (activated embryonal rests) seems to have the greatest number of adherents. Careful study in our series of cases failed to suggest any etiological factor even remotely concerned in the production of this tumor other than those commonly recognized.

Location. The body of the uterus is the common site of the sarcoma although it occasionally is found in the cervix.

Classification.

1. *Corpus Uteri*
   - A. Topographical
     1. Intramural
     2. Submucous
     3. Subserous
   - B. Histological
     1. Spindle cell
     2. Round cell
     3. Mixed cell
     4. Giant cell
   - C. Antecedents
     1. Primary
     2. Pre-existing fibroid
   - D. Limitation
     1. Diffuse
     2. Circumscribed
2. *Cervix Uteri*

Pathology and Histogenesis

A. Topographical:

1. Intramural. These growths may be primary, but more frequently develop as a result of metaplasia in a pre-existing uterine fibromyoma.

The "primary diffuse type" which is very rare, converts the uterus into a soft, smooth, organ not unlike a pregnant uterus. The cavity is elongated and the endometrium thickened.

The "primary circumscribed type" is characterized by a small, dense, sometimes encapsulated growth arising from the muscle cells, the connective tissue or the perivascular tissue of the uterine wall. The encapsulation is not perfect and diffusion occurs towards the uterine cavity or towards the peritoneal surface of the uterus.

2. Submucous and subserous types are usually larger than the interstitial and may reach huge dimensions. In advanced cases it is impossible to determine the point of origin.

Endometrial sarcoma assumes either a diffuse or circumscribed contour and occurs less frequently as a primary form than that originating in the muscle.

B. Histological:

1. Spindle cell. The spindle cell sarcoma is the commonest variety found in the uterus. It

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develops as a metaplasia in fibromyoma; the resulting fibrosarcoma or myosarcoma depends upon the particular form of differentiated connective tissue which it most resembles.

2. Round cell, mixed cell, and giant cell types are cell forms, together with the spindle cell type, all of which are transitional phases in the same general metamorphosis. Sarcoma is a tumor of undifferentiated mesodermic tissue; and as morphological alteration in the cells proceeds, the process may cease at any period in the differentiation. Thus, the first change is that of the spindle cell. This may persist as such, may become mixed-cell in type, or may develop into a pure round-cell form.

C. Antecedents:

Sarcomatous degeneration of fibroid tumors is relatively infrequent. Many cases, however, have been recorded in which the unchanged muscle cells and the sarcomatous spindle cells are in clear opposition. From this it appears that direct metaplasia must be accepted as a fact.

When sarcomatous changes occur, the tumor bears a striking resemblance to raw pork. A yellowish-white, homogeneous tissue totally devoid of fibrous elements replaces the pink-colored, coarse, fibrous arrangement seen in fibroids. The lack of standards among different gynecological pathologists for determining malignancy has led to wide variations in the statistics showing the frequency with which sarcomatous changes occur.

D. Limitaton:

1. Diffuse type. This is the more common variety originating in the fundus and rapidly involving the entire cavity of the uterus. It occurs in adult life, grows rapidly, and results in a smooth, regular, uterine enlargement. On section, the entire mucosa is thick, shaggy, polypoid with areas of scattered caseation, necrosis and hemorrhage.

2. Circumscribed type. This growth usually begins in the fundus as a small nodule and may become either submucous or intramural, thus invading either the endometrium or the peritoneum.

Cervix Uteri. Sarcomata of the cervix may arise from its mucosa or rarely from the fibromuscular elements of this structure. These sarcomata are often pedunculated or polypoid and may present into the vagina.

The most interesting cervical sarcoma is the sarcoma botryoides or grapelike sarcoma. It is extremely malignant and resembles a hydatidiform mole. Growth is rapid and early metastases occurs. This neoplasm may occur in infants. Rare sarcomata of the uterus which may be mentioned are melanosarcoma, lymphosarcoma and angiosarcoma.

Metastasis and Extension. Sarcoma may spread by either metastasis or extension. Mucosal and cervical sarcomata spread toward the vagina. Those growths originating in the uterine wall usually extend through the peritoneal coat and by contiguity to the neighboring tissues.

The commonest sites for metastases are the liver, lungs, brain or retroperitoneal glands. Less frequently the intestines, kidneys, omentum and bones are invaded. Metastases occurs by means of the blood stream.

Symptoms. Sarcoma may occur at any age. The average age incidence in our group was 45 years. There is no syndrome sufficiently characteristic of sarcoma to make more than a highly presumptive diagnosis.

Although the symptoms in our group, viz.: abnormal uterine bleeding, abdominal tumor, marked pain arising in a pre-existing fibroid, discharge and pressure symptoms, are those commonly ascribed to sarcoma, these manifestations were not sufficiently definite to make a positive preoperative diagnosis except in one instance.

The co-existence of sarcoma and uterine fibroids leads to a confusion of symptoms and the presence of malignancy may pass unnoticed until hemorrhage, metastasis or necrosis render the diagnosis obvious. Sudden rapid growth of a fibroid or the development of pain in such a tumor should lead to suspicion of sarcomatous change. In our series of 13 cases six were nulliparous. Multiparity bears a similar relationship to sarcoma and fibroids.

Diagnosis. Early diagnosis is difficult, because the symptomatology is so vague, but the following are the essential points: Sudden, rapid growth; attacks of pain in a uterine fibroid; recurrence of a fibroid-like polypus; intermittent bleeding in a woman who presents a palpable uterine tumor and who is past the menopause; evidence of cachexia which is out of all proportion to the blood loss in a woman with a palpable uterine growth; large necrotic

STUDY OF SARCOMA OF THE UTERUS AT ST. LUKE'S HOSPITAL, 1927-1934 INCLUSIVE

Name	Age	Symptoms	Findings	Menstrual	Obstetrical	Pre-Operative Diagnosis	Operative Diagnosis	Pathol. Diag.	Course
M. G. Dr. A. H. C.	44	Menorrhagia, Metrorrhagia, Dysmenorrhea, Backaches } 4 yrs. 7-1-29	Large abdominal tumor	Normal until 40 yrs. of age		Uterine fibroids	Necrotic degenerative fibroid Hysterectomy	Spindle-cell sarcoma of uterus	Vesico-vaginal fistula Metastases in 3 mo. Death in 5 mo.
M. S. Dr. E. A. E.	49	Bleeding, Loss of weight Incontinence—7 yrs. } 2 yrs. 7-21-34	Pallor Large abdominal tumor	Menorrhagia Metrorrhagia	Para II Grav II	Fibroid uterus	Fibroids Hysterectomy	Spindle-cell sarcoma of uterus	X-Ray Discharged: improved in 3 wks. No recurrence.
C. C. Dr. E. A. E.	57	Loss of weight Abdominal mass— } 8 yrs.	Large abdominal tumor	Regular with menorrhagia until 56 yrs. 3 mo. amenorrhea	Para II Grav II	Ovarian malignancy	Vascular tumor of corpus Hysterectomy Salpingo-oophorectomy	Spindle-cell sarcoma of uterus	Discharged well in 4 wks. No recurrence.
F. P. Dr. H. O. J.	34	Mass in abdomen Pains in R. L. Q. 7-25-31	Abdominal tumor Cervical tumor	Normal	Grav IV Para II	Ovarian cyst	Malignant cyst-adenoma of right ovary Hysterectomy Oophorectomy	Spindle-cell sarcoma of uterus	X-Ray Metastases to liver in 3 mo. Good response to X-Ray Death in 1932
J. S. Dr. A. H. C.	46	Severe hemorrhages 7-21-28	Enlarged corpus of uterus. Curettement	Normal until April, 1928	Grav IV Para III	Sarcoma of uterus	Malignant degeneration of fibroid Pan-hysterectomy	Sarcoma of uterus	Vesico-vaginal fistula X-Ray Well 5 mo. later No recurrence.
N. O'B. Dr. H. O. J.	50	Abdominal pain Profuse bloody discharge— } 2 yrs. 7-28-31	Relaxed perineum Cervical fibroid polypus	Regular with menorrhagia menopause at 48	Grav III Para II	Cervical fibroid polypus	Degenerative fibroid 1) Removal of polyp 2) Hysterectomy 3) Salpingo-oophorectomy	Spindle-cell sarcoma of uterus	Radium—X-Ray Recurrent pain and discharge Recurrence in vagina Living
M. G. Dr. H. O. J.	39	Pain in L. L. Q. Bloody discharge 12-8-27	Abdominal tumor—large	Normal		Uterine fibroid	Degenerative fibroid Hysterectomy Salpingo-oophorectomy	Spindle-cell sarcoma of uterus	X-Ray Discharged Improved in 4 wks.
I. H. Dr. B.	60	Abdominal tumor 8-8-26	Large abdominal tumor	Normal Menopause at 50 yrs		Uterine fibroid	Large fibroid Hysterectomy	Spindle-cell sarcoma of uterus	Recurrence and death 8 months
B. M. Dr. C. A. H.	38	Sciatica—5 mo. 7-13-30	Mass in L. L. Q.	Normal Menopause at 35 yrs.	Grav V Para I	Ovarian cyst	Ovarian cyst Removal of mass	Spindle-cell sarcoma of uterus Fibromyoma	Discharged unimproved in 4 mo.

STUDY OF SARCOMA OF THE UTERUS AT ST. LUKE'S HOSPITAL, 1927-1934 INCLUSIVE

Name	Age	Symptoms	Findings	Menstrual	Obstetrical	Pre-Operative Diagnosis	Operative Diagnosis	Pathol. Diag.	Course
M. W. Dr. E. A. E.	50	Hernia Mass in abdomen 7-22-34 } 12 yrs.	Mass in R. L. Q.	Normal		Uterine fibroid	Fibroid Hysterectomy	Fibro-sarcoma of uterus	Discharged improved in 2 wks. No recurrence
M. D. Dr. A. H. C.	27	Acute abdominal pain 9-6-27	Acute abdomen	Irregular leucorrhea		Ectopic pregnancy	Rupture of right tube Right salpingectomy	Round-cell sarcoma of uterus	Improved Discharged in 10 days Living
E. B. Dr. H. O. J.	58	Pain in L. L. Q. Backache Bleeding, Discharge 12-29-26 } 1 yr.	Cervical tumor Biopsy Curettement	Normal Menopause at 54 yrs.	Para I Grav I	Carcinoma of cervix (1) Sarcoma of uterus (2)	1st) Carcinoma of cervix 2nd) Sarcoma of uterus	Sarcoma of uterus Spindle-cell	Anaesthetic death
M. W. Dr. W. T. C.	33	Rapidly enlarging abdominal tumor Dec. 1934	Large tumor	Menorrhagia 2 yrs.		Uterine fibroid	Degenerating fibroid	Spindle-cell sarcoma of uterus	Living

cervical growths; uterine tumors in infants and young girls.

Complications. These are largely due to invasion of neighboring structures and erosion of blood vessels. The bowel, rectum, bladder, ureters are the structures most frequently invaded.

Prognosis. The prognosis varies with the type of tumor. Certain fibrosarcomata grow so slowly and metastasize so late that a fatal issue may be indefinitely postponed. In rapidly growing sarcomata the duration of life is rarely over three years. The grapelike sarcomata of the cervix are exceedingly rapid in growth, metastasize early and are almost always fatal.

In Masson's series of 50 cases, the primary operative mortality was 4%, a lower rate than is generally conceded. Of the remaining 48 patients, 10 died; four during the first year after operation and the remaining six within two years. Thirty-six were in good health after the five-year period. The total mortality was about 25%. If all types of the tumor are included, and this is especially true of the grapelike variety, the mortality is probably considerably higher than these figures would indicate. Statistics are unfortunately few and scattered.

Evans in his study of 72 tumors pathologically diagnosed as sarcomatous at the Mayo Clinic concluded that the only single constant microscopical evidence of definite malignancy is the presence of a large number of mitotic figures. In the absence of mitotic figures, tumors containing many large giant cells with multiple hyperchromatic nuclei should not be regarded as malignant.

Treatment. The difficulty in diagnosis necessarily makes the treatment unsatisfactory. In the past few years radiotherapy has come rapidly to the fore, supplanting radical surgery. However, cases have been reported in which sarcomata became necrotic following radiation.

Since embryonal sarcoma cells are susceptible to radiation, good results should be obtained. Unfortunately there are no conclusive statistics relative to the merits of this therapy of which the writer has any knowledge.

Radical surgery is probably best in all early cases. This may be supplemented with radiotherapy.

The Wertheim operation is the procedure of choice followed by intensive x-ray irradiation

given in series for at least two years. No consideration of the treatment of sarcoma is complete without mentioning the work of W. B. Coley who used erysipelatous and prodigiosus toxins. It appears that the combined toxins sometimes play an important role in preventing malignant recurrence or metastases. Occasionally they may be curative but they are of particular value in the treatment of bone sarcomata. No representative series demonstrating the use of Coley's toxins in genital tract sarcoma is to be found.

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DISCUSSION

Dr. Richard K. Collins, Aurora, Ill.: I believe that Dr. Carlisle is to be complimented upon the paper which he has presented this morning and upon the way he has covered the subject. In preparation for this discussion I looked up the literature and also the records in our own hospital. In Aurora we have three hospitals, each of 100 beds. They are hospitals in which the pathologic sections are passed upon by the pathologist, and the same difficulty in finding sarcoma has been the experience there as elsewhere. In reviewing the records over a five-year period in one of the institutions and a three-year period in two other institutions, I was only able to find one case of sarcoma of the uterus. Even in that particular case the pathologist was not entirely satisfied with the diagnosis. That was the case of a woman, age forty years, who died following cesarean section for the delivery of her thirteenth child. The reason for the section was the presence of a malignancy involving the lower uterine segment, making delivery from below impossible. This was removed at autopsy and the tumor described as a mixed cell sarcoma. So I think that the one thing Dr. Carlisle has brought to our attention which we should bear in mind is that it is not an easy diagnosis to make clinically, and that at present it is made very rarely. When the pathologists have trouble I do not think we as clinicians should feel badly when we miss the diagnosis.

Dr. Otto H. Crist, Danville, Ill.: This paper is of especial interest to me because tomorrow I am scheduled to operate on a polyp which has recurred. The patient is a young woman, and I wonder if this is a sarcoma. I have only her statement that two years ago she had a uterine polyp. I would like to ask Dr. Carlisle if this polyp which protrudes through the vulva would show sarcoma or if you must go to the base to find sarcoma. I would like to ask Dr. Carlisle if the sarcoma is diagnosed early, should we do an abdominal or vaginal hysterectomy.

Dr. W. T. Carlisle, Chicago (closing): The difficulty I am sure in evaluating whether the polyp described by Dr. Crist will be a degenerating fibroid or a sarcoma will be the same difficulty that has been present since the discussion that I mentioned in 1888. The lack of adequate criteria makes it difficult to state whether that is sarcoma or not. I would like very much to have some good pathologist straighten us out. I believe, just as several others believe, that the fibroid-like polyps that recur and protrude through the cervix, particularly those that recur promptly, should be considered sarcomatous and should be treated as such. That is said simply because so many have been reported in which the first or second examination failed to reveal sarcoma, and a few months later the patient would return with sarcomatous metastases.

The choice of abdominal versus vaginal hysterectomy began at its inception as far as I am concerned in 1888, and still is one of the points of controversy.

I believe that the "ideal" treatment, presuming that a correct preoperative diagnosis has been made and any treatment is ideal, that a Wertheim operation followed by irradiation is the best we have to offer.

GYNEPLASTIC AND MINOR OPERATIONS IMMEDIATELY FOLLOWING DELIVERY

OTTO H. CRIST, M.D.

DANVILLE, ILL.

There is a large class of women suffering from conditions resulting from childbirth. This class of women is inefficient in their homes. They are inefficient in their communities. They are unjust to their families and unfair to themselves. There is a large per cent. of this number who are not having their condition corrected because they can afford neither the time nor money for hospitalization or operation.

As far back as I am experienced in medicine the teaching has been that no operative work should be done on the genital tract for at least three months after childbirth. It was believed that healing would not take place under the condition which existed after childbirth for at least, that period of time. The lochia, the edema, the congestion and the maceration which result in most cases were some of the conditions which it was thought were unfavorable to healing.

I practiced according to this teaching for years. Many times I was asked to do a repair operation when the next baby came and as many times patients were told that I was very sorry but it could not be done that way. I would be only too glad to accommodate them but I was

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sure the operation would be a failure. They were told that labor would be all they could stand and that operative procedures would not be safe. We took these statements for granted. So far as I can learn, no one had ever tried such operations until comparative recent years. These opinions were simply handed down.

At first thought, we can see that such teaching was not consistent. Everybody was advocating and practicing the repair of recent lacerations of the perineum when the general condition of the patient permitted. They were healing fairly satisfactorily. Why, then, would not an old laceration, if properly repaired, heal just as well?

Dr. Barton Cook Hirst was the first to venture from this old ruling. He devised and practiced what he saw fit to call the intermediate operation. His plan was to wait eight days for the repair of recent lacerations until involution was well under way, until congestion and until lochia were less for then he claimed better results.

I saw him do one of these operations. Under general surgical anesthesia, the tissues were brought together layer by layer. His great pride was in making a definite apex to the perineal body. The completed operation was very nice. This procedure however, was not generally accepted.

In my opinion, it is unreasonable to ask a patient who is convalescing normally to the eighth day post partem to take a surgical anesthetic and have a regular operation performed that will confine her to the hospital for 10 to 15 days longer. It might be satisfactory for clinic patients but it is not applicable to private practice.

In 1925, Bubis of Cleveland published his first paper entitled, "Gyneplastic Repair Following Childbirth." He reported 169 cases in which the results were good. The mortality or the morbidity was not increased and the hospital stay was but little more than the normal time.

I read this paper. I liked the idea. It appealed to me as a good procedure that would take care of many of these neglected cases. On the strength of this one authority, I started to watch for a suitable case to try it out. This took some little courage since all other authorities, so far as I knew at that time were condemning the idea.

While watching for proper cases, strange to say, Mrs. Faulk and Mrs. Faulkner came in about the same time. They were each Para. 5. They were each 33 years of age. They were each about 8 months pregnant and they each asked if their old lacerations could not be repaired after this childbirth. They were strangers in town. I considered that the publicity of their failures would not be great so I told them that it could be done.

I will give a brief history of these first two cases: Mrs. M. F., aged 33 years. Para. 5. Examination showed the perineum very lax, cervix was badly torn in both angles. Cystic degeneration and ectropion were marked with ulceration wide around os. She was delivered of a normal male child, weighing 8 lbs. 8 oz., on December 8. The anterior lip of the cervix was so large and heavy that a V-shaped piece was cut out transversely, destroying the cysts. Both angles were denuded and repaired in the regular way. The incision of the anterior lip was closed with catgut sutures. The mucous membrane was dissected up from the posterior wall of the vagina and a V-shaped piece excised. The levator muscles were united in the regular way and the fascia was closed with chromic gut, and this covered with mucous membrane. She was in the hospital 13 days. She had no complications. On December 28, she dropped into my office for examination, having been downtown shopping. This was one day less than 3 weeks after her operation. The union of the perineum was perfect. There was a smooth, normal perineal body. The cervix was still rough though not completely healed. On October 8, 10 months later, she had a severe leucorrhea. Examination showed the uterus in good position, perineum was perfect, and the cervix had a good, smooth, normal contour. There was a large erosion about the os. This was cauterized. Three years later, phone communications state that she is just fine, feels much better than before her operation, no pelvic complaints, thinks it was just the thing.

Second case: Mrs. J. F., aged 33 years, Para. 5. Examination showed perineum extremely lacerated, cervix negative. On January 10, she was delivered of a normal child weighing 11½ lbs. No repair of cervix. Repair of perineum as stated in previous case. There was much scar tissue in this case and it was very hard to dissect. There was quite a large amount of bleeding. She had some pain following this operation. There were no complications. She left the hospital on the 14th day. Examination after involution showed a good strong perineum. The patient was delighted with the way she felt.

While preparing this paper, I took occasion to phone these two women. Both stated that they were feeling fine; much better than before, and were perfectly satisfied with their results.

In 1928, Potter published an article entitled,

"Immediate Repair of Birth Canal Injuries After Labor." His paper dealt entirely with repair of recent lacerations of the cervix. In a talk with Potter two years ago he informed me that he took a stitch in each angle of the cervix whether or not it showed a definite separation. He claimed better involution and less cystic degeneration. It does not interfere with subsequent labors. He reported 1,000 cases so treated in 3 years with good results. In a recent communication he states that he is continuing the same practices.

In the same year, W. C. Danforth of Evanston, published an article entitled, "Immediate Repair of the Cervix Following Labor." He reported 975 cases from the Evanston hospital with good results. Out of 904 perfectly normal case, 102 showed tears that warranted attention. This goes to prove that many cervices are torn that are not suspected.

In 1928, Bubis published his second paper, "Ten Years Experience With Gyneplastic Repair." In this he tabulated 1019 cases so treated, with good results. It is routine treatment at Mount Sinai, Cleveland, where it is needed.

Bubis found that 50% of multiparas had old conditions that warranted repair. Our ratio has not been nearly so high. We do not repair a fair perineum or cervix but only those that are markedly affected or such cases as have symptoms which call for relief. The lesser cervical conditions are treated in the office by cautery.

In modern obstetrics, the major disasters approach pretty nearly the vanishing point. I refer especially to the toxemias, the infections and hemorrhage. It is time then to note the minor casualties. Let it be understood that what I am advocating here applies only to those who have modern facilities for work. It should not be attempted in the home except in case of emergency.

An obstetrician is a high-class surgical specialist; as such he may undertake his special operations where the general or occasional operator would think inadvisable. He should examine the birth canal where there is any reason to believe there might be a tear. He will find no small number of cervical tears, even where they were not expected.

I do not examine all cervices following labor as is recommended by Danforth and Potter. I examine only such cases as I have reason to suspect lacerations; cases that have had previous cervical repair; cases in which blood precedes the advancing head; operative deliveries or cases where so-called manual dilatation has been used for any reason, are examined.

I have contended consistently at home and I repeat before this august body that there is no such thing as manual dilatation. Where such is attempted it results in manual separation or manual laceration. Only nature can dilate a cervix perfectly and that is done best over a normal bag of waters. Since it is agreed that a large per cent. (according to Polak, 51%) of all gynecological surgery results from labor, it would seem that any safe and sane prevention of this would be advisable. It would be of great economic value to the patients and prevent much pain and suffering.

The operations which I have performed following delivery include the ordinary birth canal plastics, together with various other minor conditions. These have been done in various combinations on 73 patients. Of course, it is agreed that this is too small a number to be of any statistical value but being private cases as they were and being followed up with a personal interest, I believe that I am justified in forming an opinion.

There is more untreated pathology in the cervix than in any other organ of the body. This procedure corrects and prevents some of it. You can see by this number that it is only the occasional case that is considered suitable. I have been several years accumulating this number.

These operations have been done with no assistance except the regular scrub nurse on the obstetric case. She is a nurse in training. My regular assistant is at the anesthetic. The operation is decided upon from the office examination. The patient is always given to understand that the operation will be performed if conditions are favorable. After delivery, in the regular way, she is put in lithotomy position as for any gynecological operation. She is given 1 cc of pituitrin to help control the blood in operative field. She is given ether anesthetic just to the point of controlling her. The proper instruments are essential for easy work. For the cervix I use a self-retaining, lateral spring retractor. I usually place a small lap sponge in the uterus to keep the cervix free from blood. The anterior lip

is picked up with a DeLee cervix forceps. Two forceps are used, one ahead of the other, until the angle is reached and then on to the posterior lip. It is sometimes hard to grasp without following around. Inspection is carried around the cervix. If there is old cystic or scar tissue, it is cut away with long, curved scissors as in regular trachelorrhaphy. No. 2 chromic gut interrupted, closes the break. This is repeated on the opposite side, if necessary. If either lip is markedly cystic, I have frequently cut a V-chaped piece transversely from this lip. I have also used the cautery on such cysts. Cautery is not very satisfactory here on account of free blood.

If there is to be perineal repair, the pack is left in the uterus. The ordinary vaginal retractor is used. The operation is done as a regular perineorrhaphy. Operating is difficult. Tissues are friable. Dissection is hard. Bleeding is free. Wide T clamps work well to hold mucous membrane. A delicate technique cannot be carried out; however, muscles can be brought together. Fascia can be united and the whole covered with mucous membrane. The pack is now removed from the uterus. It is rougher when finished than an interval operation but an involution progresses, it looks better and better.

I have done only one cystocele operation. Results in it were perfect. The operation is very hard on account of friable tissues and bleeding. It is done in the regular way. A pressure pack was left in the vagina to control oozing and support the bladder.

The hemorrhoids which I have removed at this time have not been the large veins that come and go with pregnancy. They have been annoying skin tags or large hemorrhoids that were there before pregnancy. If large, they were ligated and cut. If small, they were cut off with no ligation.

The after treatment was the same as with any repair operation. The discomfort has not been greater than that of recent repairs. A few had to be catheterized for a few days. We sometimes see that in normal labors.

The stay in bed or in the hospital was prolonged but very little as will be shown by slide. Think what a saving to the patient and to the patient's family. She has had her baby. She has had her operation. She is at home on time.

Subsequent labors are not interfered with. Several of my patients have had babies since their operations. The cervix is the same as after any repair operation. They sometimes give way. They should be examined and repaired immediately, if necessary. The perineal scar is the same as after any perineorrhaphy. These usually need opisiotomy at subsequent labors. I have never yet found a heavy perineal scar an indication for Caesarean section. A deep episiotomy takes care of any perineum. For the most part, these operations were done on patients who did not expect to have additional children. The operation however, is no contra-indication to other pregnancies and labors.

My results have been very gratifying as I will show by slide. No patient has been dissatisfied with her results. One, however, did object to paying her confinement bill because I did not repair her perineum as we had intended. This case was not repaired on account of excessive hemorrhage.

The main advantages of gyneplastic operations at this time are:

First: Many patients are relieved of pain and suffering and debility, who either would not, or could not, be operated on at any other time.

Second: The economic saving in hospital expense and time from home is no small item.

I wish to recite a few case histories as proof of these points:

Case 18 in my series: Mrs. P., aged 26 years, Para 3. Examination: Cervix; lacerated with marked cystic degeneration; lacerated in both angles. Perineum; very lax. Leucorrhea since first child. Operation: Cervix; cystic parts cut away; angles denuded and sutured in regular way. Anterior lip from which a V-shaped portion was excised was sutured together. Posterior lip was normal. No cautery used. Perineum: Not a very extensive repair; regular technique. Patient left hospital 13 days following delivery. Examination on leaving hospital; perineum perfect. Examination 2½ months later; conditions perfect throughout. Uterus in good position, cervix had a round os, perfectly healed and smooth; no scar noticeable; perineum perfect; slight discharge.

Case 33. Mrs. M. Para 5. Frail, little woman, weighing less than 100 lbs. Extreme bulging cystocele; large, boggy mass just below meatus. Cervix very thick, cystic and heavy. Lacerated in both angles and turned out. Perineum very lax. Uterus hanging low. Immediately following labor, Jan. 21, the cystic portion of the cervical lip was cut away with a V-shaped excision. Both angles were excised. Three sutures were placed in either angle in the repair of the cervix. Cystocele was split and dissected back in the regular

way. Excessive tissue was removed. The fascia was brought together by imbrication. There was excessive bleeding. Friability of the tissues made operating very difficult, Perineum was repaired in the regular way. Excessive mucous membrane was removed; closed layer by layer. The general condition of the patient was satisfactory at the close of the operation. A gauze pack was left in the vagina over night as a compress to control bleeding and support the bladder. The patient had no complications. She left the hospital 11 days after labor. Examination in my office on February 10th, which was one day less than three weeks after delivery, showed perineum and cystocele in perfect condition, the cervix well healed and the os round. She had been doing her own work and drove to town from 12 miles in the country. This is my banner case.

Case 36. Mrs. H., aged 25 years, Para. 2. First labor was a hard forceps delivery with complete laceration. This had been repaired with a poor result. She had very little perineum which was solid scar formation. She had poor sphincter control. She had been told by the Doctor who had previously taken care of her, never to have another child or she would surely die. Labor was induced at term by quinine and castor oil. Normal delivery with deep episiotomy around the perineal scar. No repair was done on the cervix. Perineum: Old scar was cut away; muscles and fascia dissected out; sphincter united in mass and levator muscles closed high and this was covered with pelvic fascia forming a dense, heavy perineal body. The patient had no complications. She was in the hospital 15 days after delivery. Examination in my office six weeks following delivery; she states sphincter control is perfectly good. Perineum is a good, firm body. Cervix has no erosion. There is no discharge. Uterus was in posterior position as it was before pregnancy.

Case 40. Mrs. D., Para. 2. First labor had been a hard posterior, instrumental delivery, at which time she had a complete laceration. This repair was attempted immediately, but was unsuccessful. About two weeks later, she was taken to the operating room and the lacerations were repaired. She came to me with her second pregnancy. Examination showed practically no perineum and what she had had been by granulation. A thin fibrous scar made up the perineal body. She had poor sphincter control. Before labor she carried her baby in the right posterior position as she said she had her first child. This position was corrected by abdominal binder and pads before labor. This case would have had indications for Cesarean section by many men. I advised that by deep episiotomy she would deliver normally. This was done and labor was practically uneventful. After labor, the perineal scar was dissected out and the vaginal mucous membrane was lifted and the perineal body built up with muscle, fascia and mucous membrane. Recovery was uneventful. She was in the hospital 12 days. Examination later in my office showed a fairly good perineal body, good sphincter control, some cystocele and the uterus low in the pelvis and posterior. I have delivered this woman 3 times since this. Each has been with deep episiotomy and results have been, better perineum and better condition with each succeeding repair.

Case 47. Mrs. L. Para. 3, age 40 years. Cervix was lacerated at both angles and ectropion and marked cystic degeneration. She had no perineal body. After labor, all cystic parts of the cervix were cut away. Repair was made on both angles. The perineum was repaired in the regular way. She was in the hospital 12 days. Examination in my office, six weeks following labor, showed the uterus in good position, cervix and os like nullipara, perineum in perfect condition holding up like nullipara woman.

There are, however, certain contra-indications for operations at this time:

1. Excessive hemorrhage.
2. Long labors with shock.
3. Hard operative deliveries.
4. Lung involvements.
5. Infections or potential infections.

From the experience of others, and from our own experience, we might draw the following conclusions:

First: Repair of old pathology of the birth canal and minor operations after labor are sane, practical and advisable.

Second: Pain and suffering or discomfort is no greater than immediate repairs or intermediate operations, or interval operations.

Third: Contrary to previous teaching, healing is just as good as in immediate, intermediate, or interval operations.

Fourth: The stay in the hospital is but very little prolonged.

Fifth: From an economic standpoint, it is highly commendable.

Sixth: Subsequent labors are not interfered with or complicated more than following any repair operation.

Seventh: Operative deliveries are not contra-indications so long as the patient is in good general condition.

Eighth: Obstetric cases should be given the same consideration as major surgery and require the same high-class surgical skill.

DISCUSSION

Dr. Frank F. Maple, Chicago: I think Dr. Crist has fairly stated the pros and cons of obstetrical repair of conditions following this labor and the labors that have preceded the one in hand. I agree with Dr. Crist entirely that 51% of our gynecological operations are due to poor obstetrics and the other 49% to the gonococcus, and we could remove those and also remove the gynecologists. I agree with Dr. Crist that neither he nor I can do a manual dilatation. I believe we

always get tears if we do dilatation. Perhaps they are not visible; they may be minute, separation of the muscle perhaps, but that cervix will show a tear at subsequent examinations.

Dr. Crist has stressed the permanency of this procedure. If I take the negative it is for two reasons. First, the experience of those whose judgment I greatly respect. Dr. Webster was very much against such operations early, as he was against operations performed during the puerperium. It was his conviction that it took a woman's tissues twelve months to return to normal. Dr. DeLee does not approve of operations during the ten or twelve days' stay in the hospital. He is also against performance of operations during delivery. P. Brooke Bland of Jefferson Medical College takes the same stand. Dr. Beck of the Long Island Hospital and College takes the same stand, though he will change his opinion on advice. I have had occasion to look up my own cases after I was notified of Dr. Crist's intention to read this paper. My series was only thirty, and this included one cystocele, one rectocele, the rest being perineorrhaphies and vaginal repairs of some sort or other. In my cystocele I cut into the bladder, the only bladder I have ever gotten into in operation. I believe had I the operation to do again I would again cut the bladder because I cannot identify those tissues. The patient with the rectocele went home in good shape, and, as Dr. Crist said, there was apparently no suffering from the operation.. She returned some weeks later with the same complaints. I found that she had a rectovaginal fistula which I could not account for. My operations for perineal repair looked fairly well at the time but I was not satisfied when these women returned a month or several years later, even though there were no symptoms on the part of the patient. The job did not look good. I believe that Dr. Crist admitted that he was compelled to omit the finesse of the operation, because the operation could not be done as well as though it were performed twelve months later.

If we summarize the reasons for the conditions that I gave and that Dr. Crist feels that he was able to overcome, we might state then under a few headings. We know the lochia is infected in twenty-four hours. We know that 70% of the genital tracts contain some variety of streptococci. If we open up new locations for the invasion of organisms, we are fearsome that these organisms present as they are and the lochia furnishing a nice medium, will extend the infection to tissues not otherwise involved. We know we have a distorted anatomy. We know we have intertissue hemorrhage and hemorrhage that is not grossly apparent but does exist nevertheless. We know that we have agglutination of tissues, that we are not able to identify fascial planes, but we are able to identify muscle and mucosa. We are very much afraid that cystoceles and rectoceles lend too much danger of damage to the underlying viscus. We know we are operating in the presence of hemorrhage. Dr. Crist gave both sides of the question and gave all the material, and gave it fairly.

Those are my objections to doing operation and they may have come about through my own results. We always do routine episiotomies on multparas at full term. These episiotomies lend themselves to surgical repair. We make a routine examination of the cervix after manipulative or operative deliveries only, not after spontaneous deliveries. We rather take a chance on an unobserved lesion being there than to examine every case that has just been delivered. The episiotomies are repaired layer upon layer. I wonder if the experience of the others present is the same as mine, that even though we have done a nice episiotomy and apparently a good repair that when this woman comes back in six months or twelve months, I am not satisfied. We do not get 100% perfection in our episiotomies, but we are doing the best we can with the knowledge we have.

Dr. William F. Hewitt, Chicago: I would like to ask Dr. Crist if he has had any experience in over-repairing, in other words, getting the vagina too tight. It was the experience a long time before episiotomies and perineotoinies were so commonly done that a beautiful delivery would be carried out from the standpoint of having no tear, and six months later the patient would come back with a nice cystocele and rectocele, after the obstetrician had very carefully informed the husband and relatives that there were no tears. In other words, there is a difference in looking at an old perneum that is edematous and one in which the tissues show the softening of pregnancy. Therefore, I wonder how much trouble Dr. Crist had in training his judgment on how much to take up and when to stop.

Dr. Otto H. Crist, Danville, Ill. (closing): I have been fortunate, according to Dr. Maple, in having no bladder or rectum opened. I stated in my paper that I did not do many cystocele operations. I would like to show you, if you come to Danville, some of my results. I have had no case break down as a result of injection, which Dr. Maple mentions as possible. I have wondered myself sometimes why it did not happen but it does not. We have all had the results with episiotomy that Dr. Maple mentioned. Nobody has been able to explain them on local conditions so far as I know. The patient goes home with a result you think is perfectly good and when she comes to the office you are ashamed. There are certain individual tendencies of muscle, tissue and constitution which cause that result.

As to experience with over-repair, I sometimes get an over-repair with interval operations but I have not noticed that it was more common at this time than after perineal repair at any time. We simply try not to do it. We watch the space of muscle and fascial closure. Once in a while we do get an over-repair, but not more often than at other times.

I think I answered Dr. Hewitt's last question in describing a case of perineorrhaphy that came to the office and we were ashamed of. I have had as good functional results though not as smooth with this operation as with the interval one. I can show you

a good many cases with a round os after repair at this time, which is more than I frequently get after an interval operation of trachelorrhaphy. The perineums are built up not so good to look at, but functionally good, and the women are satisfied.

MEDICAL DISORDERS IN PREGNANCY AND THEIR EFFECT UPON LABOR

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Our ideas concerning those diseases with which pregnancy may be associated have undergone a complete revision within the last decade. Heretofore, it had been customary to speak of any medical disorder as a complication of pregnancy and, therefore, to lose all perspective with reference to both. At the present time it can be definitely stated, certainly with respect to those chronic diseases such as tuberculosis, diabetes, cardiac disease, nephritis and thyrotoxicosis that these constitute primary medical disorders and the superimposed pregnancy is a secondary added factor and therefore, a complication of the primary disorder. The course of any pre-existing disease with the added burden of pregnancy must certainly be modified and often to the detriment of the patient's health and longevity. It must be admitted also that the pregnancy is likewise modified. Our problem is to study the effect of pregnancy on any given disorder and to determine to what extent and for how long both can be made compatible. The application of sound principles of medicine, treating the individual patient as a whole, study of the primary pathology and its modification by pregnancy, with the co-operation of the services of a competent internist will do much to simplify the problem. In this way many more pregnancies can be carried to term or close to term that might otherwise have been unwarrantedly sacrificed, and on the other hand a pregnancy producing a deleterious effect upon the patient can be interrupted, thus prolonging the patient's life. Where the services of an internist are not available, the entire responsibility may fall upon the medical attendant to be dealt with single-handedly. Another factor of importance is the proper evaluation of maternal morbidity and mortality as it is now admitted that these medical disorders may be directly or remotely responsible for a part, at least, of our so-called increased maternal morbidity and mortality. I shall consider the major disorders mentioned above, give their clinical course as modified by pregnancy, and cite case reports wherever possible showing a favorable outcome by co-operative management and by the institution of both conservative and radical treatment to meet the needs of the given case.

Tuberculosis and Pregnancy. Although much progress has been made in the treatment of tuberculosis in recent years, the question of this disease complicated by pregnancy is still in a very nebulous state. While there are several types or classifications and groups of circumstances, individualization seems to be the most important factor. Consequently, it is very difficult to generalize.

With reference, first of all, to the advisability of pregnancy in a tuberculous individual, it can be stated that the patient who has an arrested tuberculosis of three years' standing, who is maintaining her weight, whose sputum is negative for tubercle bacilli, whose physical examination of the chest reveals a healed process, may undertake pregnancy if she so desires. It is impossible to state in advance or even early in pregnancy what the outcome may be. Even in arrested, healed tuberculosis an old focus may be activated during pregnancy or in the puerperium. If pregnancy is established and the patient continues to do well, she may continue with her pregnancy under careful supervision. From the standpoint of pregnancy this type of case is the most favorable; many such patients go to term. Should clinical symptoms develop within the first trimester of pregnancy, the question of termination and the method must be considered. Under these circumstances it would seem advisable, more particularly in a nulliparous patient where the desire for a child is paramount, to resort to therapeutic abortion preferably by dilatation and curettage under morphine and local anesthesia. The operation should be done in one stage. The patient may then be instructed to carry out a rigid course of sanatorium treatment, or home treatment if the former is not possible, and to try pregnancy again at some future time. Where abortion is refused, sanatorium treatment or prolonged rest, must be carried out for the duration of the pregnancy.

From the Departments of Obstetrics of Michael Reese and Wesley Memorial Hospitals.

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The semi-surgical procedure of pneumothorax may be done in cases where there is unilateral involvement; surgical procedures such as thoracoplasty and others, are not recommended.

In the case of open or active clinical tuberculosis pregnancy should not be undertaken. If pregnancy should occur under these circumstances, the serious nature of this complication should be carefully explained to the patient and her family. Interruption of pregnancy is advisable early in its course. There are two procedures which may be carried out. If the patient is a multigravida, the course is made easier provided there are no personal objections. Such a patient, as regards her tuberculosis, would do better not to have future pregnancies. Therefore, abdominal hysterotmy and sterilization are the operations of choice. In the case of a primagravida or multigravida where a child is highly desirable, therapeutic abortion is the operation of choice, carried out as mentioned above. This leaves the way open for a future pregnancy and a possible rest period of two to three years, preferably in a sanatorium, where the necessary treatment can be directed primarily to the tuberculosis. Also, in this same type of case, if interruption of pregnancy is refused, the patient must bear the risk of the possible downward course which may undoubtedly become manifest either in the puerperium or a little later.

Termination of pregnancy, to be of any value at all, should be done early. The apparent improvement in the later months of pregnancy due to the growing uterus and the rising diaphragm is no assurance that the tuberculous process has been arrested. The danger in the puerperium is very great. A number of rapidly progressing fatal tuberculoses are traceable to this fallacy.

In those patients who have been fortunate enough to carry to term, under the course of treatment as outlined above, the conduct of labor is highly important. The first stage should be carried out under analgesia; morphine or pentobarbital gives excellent results. The second stage should be as short as possible; prophylactic forceps is a commendable procedure. The question of anesthesia is important. Ether is contriindicated; gas may be employed although it increases the tendency toward cyanosis which is not desirable. Local anesthesia or sacral block anesthesia may be recommended. The delivery should be carried out with as little shock, trauma and surgery as is consistent with good work. Cesarean section is not indicated unless there is some pelvic contraction, or where sterilization is carried out at the same time; local anesthesia is recommended.

The puerperium is a critical period. Rest is important; involution of the uterus should be hastened with any of the ergot preparations. Theoretically, it has been stated that the products of cellular autolysis as a result of uterine involution have a deleterious effect upon tuberculous lesions, healed or otherwise. This may be the reason for the downward course in the puerperium. Lactation is not necessarily contraindicated in the "closed" case; it is definitely contraindicated in the "open" case. In either event lactation is an unnecessary strain that can easily be dispensed with, in the interest of the mother. The question of contact of the baby with its mother is of more than academic importance. All babies should be removed from the possible influence of an early acquired tuberculosis. The prognosis for the baby under these circumstances is very good. It may be mentioned also that there is a possibility of congenital tuberculosis; hereditary tuberculosis is denied. The pre-disposition to tuberculosis of the new-born is remotely possible.

Diabetes and Pregnancy. It has been stated that diabetics do not easily become pregnant. This statement may have been true in the pre-insulin era but at present there seems to be an increasing number of diabetics who are pregnant. Thanks to insulin, diabetes and pregnancy are no longer incompatible. There are, however, certain dangers which may become imminent at any time. In diabetes the patient's whole metabolism is affected; pregnancy, therefore, with its demands and alterations on the maternal metabolism is an added risk. Early in pregnancy the incidence of abortion is slightly increased; later there is danger of intrauterine death or stillbirth. The danger of coma is always present. Diabetics have a tendency to bear oversized babies; it is not unusual for a patient, herself underweight, to bear a nine-pound infant. Theoretically, the maternal hyperglycemia is responsible for the increased weight of the child. Some authors have maintained that the fetal

islet-tissue supplies insulin for the maternal organism and in that way temporarily immunizes the mother to her own diabetes. This is still problematical.

The problem in pregnancy with diabetes is to satisfactorily nourish the patient, maintain her weight, keep the urine sugar-free, maintain the blood sugar value at a normal level, and to prevent coma. This is accomplished by giving weighed, calculated diets of the three important food components, protein, carbohydrate and fat, together with enough insulin to metabolize completely the patient's food, keep her blood sugar normal and the urine sugar-free. Unlike tuberculosis or nephritis or cardiac disease it is rarely necessary to abort a patient during the course of diabetes, because diet and insulin can be adequately prescribed. Most diabetics have no difficulty in carrying out a prescribed regimen; they have already learned to carry out these details previously. The physician may be of further service by having regular routine blood sugar determinations made, and he may test the urine for sugar, acetone and diacetic acid during the regular prenatal visits. These latter should be more frequent with the diabetic patient. With these principles in mind the course of pregnancy can be successfully managed as stated above, but the physician should always be on his guard.

Labor in the diabetic should be as short as possible. Prolonged labor, independent of diabetes, may give rise to an acidosis. Therefore, in diabetes where the tendency toward acidosis is ever present, the physician should be very cautious. During the first stage the patient should be sustained by giving plenty of fluids, fruit juices, insulin and intravenous glucose if necessary. Analgesia may be freely employed; morphine or any one of the barbiturates is satisfactory. If the patient goes into coma be prepared to inject glucose intravenously and enough insulin to take care of the injected quantity of glucose. The delivery may be spontaneous or forceps may be applied if the first and second stages have been unduly prolonged. Cesarean section is not necessary unless pelvic contraction is present. Gas or ether anesthesia may be employed; anesthesia should not be too prolonged, because of the danger of acidosis.

Case 1. Mrs. P., gravida 4, age 28, married six years. Menstrual history began at age 13; normal and regular; family history: mother living, has diabetes, one sister died of diabetes at age 13; present patient diabetic for 13 years. Previous obstetrical history: 2 months spontaneous abortion, 1930; full term baby, birthweight 9 pounds, 1931; Cesarean section, full term baby, 1933; normal recovery after first operation, wound infection after second operation. Pelvic measurements normal. Patient referred to me in sixth month of pregnancy. Blood sugar normal, urine heavily loaded with sugar. Prenatal visits at two week intervals; urine strongly positive with Haines' solution until within three weeks of term; acetone negative; diacetic acid negative. Calculated diet and insulin prescribed. Patient entered hospital 10/23/35 under observation at term. On abdominal examination baby seemed to be of good size; x-ray examination revealed breech presentation with no other anomalies. 10/25/35 Cesarean section under local anesthesia; sterilization by Madlener technic with additional ethylene anesthesia; baby weighed 8 pounds 11 ounces. On third post-operative day patient developed pain in the chest with the findings of a broncho-pneumonia, right side. The abdominal skin sutures were removed on the eighth post-operative day, skin incision healed perfectly. Patient left hospital on thirtieth postoperative day. This case emphasizes the operative risk on a diabetic patient, namely, the post-operative pneumonia; the patient was sterilized after her third Cesarean section. The two previous sections were done because of large-sized babies and the diabetic condition and it was felt that three Cesarean sections were sufficient in one patient. The patient wished to be sterilized. 12/9/35 urine sugar free; patient not taking insulin; baby artificially fed.

Cardiac Disease and Pregnancy. Much has been written concerning pregnancy and heart disease in the last fifteen years. The entire subject is not definitely settled but certain ideas have been crystallized out. A complete evaluation of the patient's history, symptomatology and accurate diagnosis are necessary before proper treatment can be instituted. While treatment may be carried out along general lines in this group, yet individualization is necessary. Cardiac disease may be broadly classified into two types, first, milder cases associated only with cardiac murmurs; these cases usually cause no great concern and occur with a frequency of about 10%. The more severe cardiac lesions are the mitral lesions, particularly mitral stenosis and mitral insufficiency. The history will reveal in this latter group, a past rheumatic fever, scarlet fever, or a chronic focal infection. It is important to emphasize also that the anatomic or pathologic localization of the lesion is not the sole factor to consider. The effect of prolonged cardiac disease on the heart muscle itself is of

importance and the response of the heart muscle to exercise or exertion is also important. Pardee's classification is very helpful. His classification is as follows:

Class 1. Mild cardiac lesions, quick response after exercise; not expected to give trouble from cardiac insufficiency.

Class 2a. This is the "fairly well compensated" class; slower response after exertion; probably will not give trouble in pregnancy or labor.

Class 2b. Slow or poor response to exercise; this is the "somewhat decompensated" class, may give trouble during pregnancy or labor.

Class 3. This is the definitely "decompensated" class; these cases are serious throughout pregnancy and labor.

The management of pregnancy in all cardiac cases is important. Diagnosis may be difficult from the start, particularly late in pregnancy on account of altered abdominal and chest relationships. Therefore, patients in this group should be seen as early as possible in pregnancy. The cardiologist's services are extremely valuable. Rest is of prime importance throughout pregnancy; intelligent medication may be prescribed when necessary. Digitalization should not be overdone. The whole idea throughout the course of pregnancy in the cardiac patient is to prevent decompensation, to restore compensation where it has been lost, and therefore, to prepare the patient for the event of labor with as competent a heart as possible.

The question of termination of pregnancy might have to be considered early. If termination is necessary it should not be done after the fourth month, even in the most severe grade. Patients who go beyond this period will usually go to term or near term. The method of emptying the uterus, if it becomes necessary, should be the one that will produce the smallest amount of trauma. Even early in pregnancy it is preferable to do hysterotomy and sterilization under local anesthesia if the patient's condition will permit it. If this is impossible dilatation and curettage, under local anesthesia, is better.

Conduct of labor in the cardiac: The duration of labor has been observed to be much shorter in cardiac patients than in normal patients, both in primiparae and multiparae. The reason for this is usually ascribed to the increased congestion and edema of the cervix, vagina and pelvic floor. Analgesia is very important and should be freely used. Morphine is the drug par excellence; it may be repeated in the first stage if necessary. It may also be used in the second stage. The question of anesthesia must be carefully considered. Ether is a safe anesthetic and can be given carefully by the house staff. Gas when given by an expert is considered relatively safe by some obstetricians, but it should be remembered that the danger of cyanosis and asphyxia is slightly increased. Local anesthesia is practical and satisfactory; spinal anesthesia has been used but this method requires special administration and is not necessary.

The method of delivery: In those patients who can be satisfactorily delivered from below spontaneous delivery may be allowed in the compensated group of patients; forceps should be the method of choice in those patients in whom compensation is questionable. Personally, my choice would be prophylactic forceps in all cardiac patients; one never knows the actual amount of cardiac reserve present in any patient, compensated or otherwise. Cesarean section has been done frequently because of the heart condition per se; this operation is not necessary unless there is a physical obstruction to labor. It has been employed also where it might be desirable to sterilize the patient at the time of labor. From a conservative standpoint these procedures at the present time are not looked upon with favor. My own reaction is that a multipara might satisfactorily be "Cesareanized" and sterilized at the time of labor or even before labor; a primipara in the milder group of cardiac patients need not be sectioned or sterilized unless she so desires. Patients in Class 3 at term should be "Cesareanized" and sterilized. The following cases are cited to show the management during pregnancy and the method of procedure chosen for delivery:

Case 2. Mrs. S., gravida five, age 33, was seen in prenatal clinic in the sixth month of pregnancy. Her pelvic measurements were normal. In 1921 she had an instrumental delivery in her first pregnancy. In 1924, 1927 and 1930, she had normal deliveries; all were short labors, less than five hours. In her fifth pregnancy the diagnosis of mitral stenosis was made. She was advised to take bed rest at home for a period of three months. She entered the hospital two weeks before term for observation for one week. She received practically no medication except an occasional sedative; her heart was well compensated. She was

sent home and returned one week later (12/21/35) in active labor. Her first stage lasted seven hours and twenty minutes; she was given morphine and the interne was instructed to call me when the patient had 8 cm. dilatation. He was further instructed that under no circumstances would the patient be permitted to bear down. Immediately upon complete dilatation of the cervix forceps were applied. A mid-forceps operation was done under combined local infiltration and light ether anesthesia. The second stage was eliminated almost entirely. The patient had a normal, uneventful puerperium and was discharged on the tenth postpartum day.

Case 3. Mrs. H. gravida III, age 22; two previous normal deliveries, 1932 and 1934. Diagnosis mitral insufficiency, 1935, in third pregnancy. Patient was given a prolonged rest period during her entire pregnancy. Entered hospital 8/21/35, at term, not in labor. Patient and her husband requested sterilization. After consultation with the medical department, it was decided that this would be the best course for this patient. 8/22/35 under sodium amytal and morphine premedication, and local infiltration anesthesia, a Cesarean section was done. A sterilization was then done by the Irving technic under additional ethylene oxygen anesthesia. The entire operation required about one hour. The patient had an uneventful convalescence. She was discharged from the hospital on the tenth postpartum day. The follow-up on this patient 9/26/35, involution complete; physical findings of heart were about the same as six weeks before, although patient felt much improved. 10/1/35, pulse 80, regular, slight dyspnea, palpitation, precordial pain, no edema. 2/18/36, pulse 84, dyspnea, palpitation and precordial pain. 3/3/36, much improved, not permitted to do heavy housework. 3/10/36, pulse slow, regular, no congestive failure, digitalis stopped, light work permitted.

Aortic lesions are much less common than the mitral lesions. The general principles previously stated apply here. Where there is syphilitic involvement of the aorta, anti-luetic treatment should be instituted.

Chronic Nephritis and Pregnancy. In most text-books, this disorder is included with the toxemias of pregnancy. While toxemia occurs in chronic nephritis, yet the latter is a definite clinical entity by itself and will be considered similarly with the previous medical disorders within the scope of this paper. Those patients who have chronic nephritis and become pregnant are definitely made worse as pregnancy advances. The amount of kidney damage is irreparable. The past history usually reveals chronic focal infection or scarlet fever in childhood. There may be a history of loss of several previous pregnancies either by abortion, premature labor, or stillbirth. The symptoms are usually persistent high blood pressure, edema, albuminuria, blurring of vision. Prolonged bed rest ameliorates the symptoms only very slightly. Where the desire for a child is very great, the patient may be permitted to approach the period of viability or term only after the nature of the disease has been carefully explained to her and her family. They should be told frankly that there is no improvement after delivery and that the life expectancy is appreciably shortened. Should it become necessary to terminate pregnancy the following procedures may be recommended: in the first trimester, dilatation and curettage may be done with the advice that no further pregnancies should be undertaken. After the fourth month of pregnancy hysterotomy and sterilization are the procedures of choice. After the period of viability, labor may be induced, bearing in mind the uncertainty of the methods employed in the induction of labor, or Cesarean section and sterilization may be carried out. This latter seems to be the best procedure at or near term. The following case is cited:

Case 4. Mrs. B., gravida VI, age 39, married 6 years. Scarlet fever in childhood. 1929, 1930, 1931, 1932, spontaneous delivery of 6 to 7 months fetuses; November, 1934, spontaneous 3 months abortion. Present pregnancy (sixth) patient due 11/16/35. Since 8/8/35, B. P. 178/100 and continued to rise to 210 systolic and remained stationary. 8/9/35, patient admitted to hospital, B. P. 218/120 on admission. Bed rest, low protein salt free diet, ten days. Blood pressure remained the same; urine albumin 4+; granular and hyaline casts; Wassermann negative. The patient was extremely anxious for a child, having had five previous pregnancies and now in her sixth, with no children. The serious involvement of her kidneys was explained to her and her family; they were advised to have the pregnancy terminated, to which they finally agreed. It was thought on 8/19/35 that the baby might possibly be viable. A hysterotomy was done under ethylene oxygen anesthesia; the baby weighed 1 pound, 13 ounces and lived about ten minutes. The placenta was a mass of infarcts. A sterilization was done by the Madlener method. The patient was discharged on the twelfth postpartum day, B. P. 148/88. Six weeks later the patient's blood pressure 180/120, albumin 4+, casts. The patient was discharged from the clinic with a diagnosis of chronic nephritis and referred to the medical department.

Thyrotoxicosis and Pregnancy. The thyroid gland undergoes some hypertrophy during pregnancy; certainly the hormonal activity of the thyroid is increased. The milder cases of hypertrophy with no symptoms call for no treatment.

Rapid pulse, tachycardia, nervousness, slight exophthalmos, symptoms pointing to thyroid gland disturbance, may call for medical treatment. Such mild cases of thyrotoxicosis do well with Lugol's solution in small doses at intervals. There should also be rest periods in the course of treatment. If the condition becomes progressively worse, prolonged bed rest may be necessary in addition to medical treatment. If the basal metabolism rises to +40 or higher medical treatment may be unsatisfactory. It is rarely necessary to interfere with the pregnancy early in its course. It is better to resort to surgical treatment if necessary at this stage. Later in pregnancy, particularly after the period of viability or near term, the pregnancy can be terminated with greater assurance of obtaining a living baby.

The principles enunciated in the treatment of cardiac cases will also apply in the treatment of cardiac conditions associated with thyrotoxicosis. These need no further elaboration here.

Summary. Pregnancy is not incompatible with such medical disorders as tuberculosis, diabetes, cardiac disease, nephritis and thyrotoxicosis. The application of the principles of medicine to the treatment of the disease which is the primary disorder will permit many patients to carry their pregnancies to term. Where pregnancy produces an unfavorable effect on the disease, or threatens the patient's life, there should be no hesitancy in terminating the pregnancy by the safest procedure and the one most suitable to the best interests of the patient. Individualization and evaluation of the patient's condition and needs are of paramount importance.

CONCLUSIONS

1. Chronic medical disorders are a primary condition in pregnancy; pregnancy is a secondary condition and a complication.

2. The internist's co-operation is highly desirable at all times; the final responsibility rests with the obstetrician or the patient's own medical attendant.

3. Chronic medical disorders are not incompatible with pregnancy, and individualization in treatment is of prime importance to the patient.

4. Follow-up of patients with medical disorders complicated by pregnancy is as necessary as follow-up in surgery for malignant disease.

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DISCUSSION

Dr. C. C. Rentfro, Chicago: Dr. Serbin's paper has certainly covered the subject quite thoroughly. The mortality and morbidity have interested me a great deal in the last few years. I have looked over the morbidity in the hospitals of Chicago; in 1934 out of 2145 morbid cases there were 921 cases of septicemia and 45 cases of contagious disease. In the state of Illinois there were 532 deaths from all types of disease, so that this paper brings to us many of the things that caused these morbidities and mortalities.

In tuberculosis, I think one of the important things in dealing with the tuberculous patient is early diagnosis, therefore a thorough history to find out all about the patient and knowing what you have to deal with. Many of the troubles you get into later are due to an incomplete diagnosis of the condition. What he said about this condition I can do no more than amplify. I think he spoke about the barbiturates in connection with delivery in these cases. I believe they are rather contraindicated in tuberculosis. I would rather use some other form of sedative.

He covered the question of diabetes very well. Probably if the patient has had several children sterilization would be a very good thing if the patient wished it.

One per cent. of all maternal cases are cardiacs of varying degrees. Six per cent. of that one per cent. die sometime during the antenatal or postnatal period. In Philadelphia they reported 39 out of 69 deaths in the last month of cardiac disease, which shows its great importance. Thirty died before the twenty-eighth week. If obstetrics is part of our general practice it behooves us when we get an obstetrical case with one or more of these diseases, to get down the old book and read up. I remember Dr. DeLee saying once, "do

the best you can with a case and when you get a chance read it up in the book."

Dr. Serbin covered these other diseases so well that I merely want to dwell on one in closing, that is syphilis. He just mentioned it. One of the pediatricians was reporting cases of syphilis, and in discussing it later I said if the obstetrician did his work right, the pediatrician would never see syphilis. A number of years ago I did a Cesarean section on patient, and my surgical associate said, "the baby does not look exactly right to me, have you done a Wassermann on this patient?" I said no. In the last three years this woman had had a half dozen Wassermanns because she had an accident and the fractures did not heal. I had overlooked an important thing—the husband had a four plus Wassermann. In every case since then the woman has had a Wassermann, and if any trouble arises we explain to her that it is for the sake of the baby. I believe it is important that a Wassermann be done on every patient.

Dr. Ariel L. Williams, Chicago: Concerning syphilis, as a disease which can be complicated by pregnancy, it should be taken very seriously. I do not think we are doing as much for our private patients who might have syphilis as we should. In the past few years by taking routine Wassermanns on my patients I have found about a dozen positives in some whom I would never have suspected of having syphilis. There is a movement on foot in Chicago now where the health director is asking all doctors who deliver babies to get a Wassermann. If the patient cannot pay for it herself, the Health Department will do it without charge.

I know the staff of Ravenswood Hospital send their patients in for Wassermanns as soon as the patient presents herself for prenatal care. Having found about twelve positive Wassermanns in the cases that go to our hospital, I think we ought to take it home for consideration, and also from the fact that the health director is urging our cooperation in getting Wassermanns.

Dr. R. W. Doud, Normal, Ill.: I would like to ask Dr. Serbin about the treatment of varicose veins during pregnancy, if he advises injections or otherwise.

Dr. Frederick H. Falls, Chicago, Ill.: I think this type of paper is exactly what we should have at these meetings, because it deals with practical problems. I think Dr. Serbin should be commended for his conservative attitude, particularly in treating tuberculosis. It was not long ago that as soon as a pregnant woman was found to have tuberculosis, no matter what extent of a lesion, abortion was immediately advised. Such cases are being sent to the Research Hospital for me to abort. Before his death Williams reversed his position in the management of these cases because he found that a group of cases that had been aborted in the interest of the mother for tuberculosis did not do as well as those that were allowed to go to term. This was true even in the open cases. In case sterilization is necessary in these cases of tuberculosis, it has been our custom to allow them to deliver and recover and then sterilize them through the vagina under local anesthesia. The operation is very simple. If there is some cystocele we do an interposition operation. If there is no cystocele, the uterus can be returned to the abdominal cavity.

In diabetes there has recently come to our attention some serious cases of associated hyperemesis gravidarum. In these cases it has been hard to say whether we have two separate conditions, hyperemesis gravidarum and diabetes or whether the hyperemesis was part of the diabetes. At all events when vomiting occurs in these diabetic patients, one should remove the patient to the hospital and put her on the most stringent diabetic regime. We combine with this 30 gtts. of Lugol's solution a day which we feel is of distinct value in hyperemesis gravidarum. This may have to be given by proctoclysis or hypodermoclysis.

In heart lesions I just want to bring out the fact that labor is very apt to be relatively painless. Dr. Serbin mentioned that it is apt to be very rapid. One should watch these patients, especially those that are slightly dyspneic because they may go into labor and not know it themselves. In this type of case precipitate labor may occur under unsterile circumstances that may be dangerous.

In nephritis cases, one of the chief dangers that we feel the woman has to face is the loss of the baby. Because these placentas have had numerous hemorrhagic infarcts they are incompetent. As pregnancy progresses a slight additional infarct causes the death of the baby. Clinically, these babies are apparently perfectly normal in the uterus. The heart tones are regular and not too rapid on one day, and the next day examination shows the baby is dead. When a nephritic patient who has been carried through the earlier months arrives at the thirty-second week, we seriously debate whether it is not good policy, especially if the woman is a primipara, or a woman, as Dr. Serbin mentioned, who has lost several babies, to do an abdominal hysterotomy to give the baby the best chance, or at least we put it up to the mother to decide whether or not she wants to take the additional risk.

As regards thyrotoxicosis. We feel that there are many of these patients who are overlooked by the physician. The basal rate in pregnant women who do not show other signs of active hyperthyroidism may be high. These we treat with small doses of Lugol's solution. Active hyperthyroid symptoms have been treated with large doses of Lugol's solution not over short periods of time with intermittent periods of rest but throughout pregnancy, giving ten drops of Lugol's three times a day. There is a difference between the action of Lugol's solution on thyrotoxicosis in the pregnant and non-pregnant woman. We have had patients come into the Research Hospital with basal metabolic rates of plus 110, and curiously enough these patients do not show the typical symptoms of marked cases of hyperthyroidism, but what they do show is hyperemesis gravidarum. We treat them with Lugol's solution and thyrotoxicosis symptoms disappear. We have had surgical as well as medical consultation on these cases. Thyroidectomy was advised by the surgeon,

because it was felt that medical management would be of only temporary benefit. We were told that the patient would go into collapse at about the end of two weeks' treatment, and then operation would be impossible. This collapse did not occur. The patients went through pregnancy, and the hyperthyroidism symptoms disappeared and they improved after the pregnancy was over. Some were subsequently operated on and some were not.

Dr. William B. Serbin, Chicago (closing): If one started to write about all the medical disorders in pregnancy, he could write a book. I hesitated to write the paper because I felt the subject was already sufficiently emphasized, but I am happy to note your interest in it.

In selecting cases, I picked out the most typical ones within the last six or eight months that I remembered well enough and that might have occurred in the practice of anyone of you. When you once make up your mind to do a thing, for example, to interrupt a pregnancy if it becomes necessary, you should have the character to go ahead. It takes great character to empty a uterus in spite of the fact that the family does not want it or that you may not want to do it. There may be strong objections but the patient's interests are always of paramount importance. I have maintained as conservative an attitude as I could. In some cases we are quite radical; in others quite conservative. The ultimate results as far as the patients themselves are concerned are good. Each case must be considered on its own merits.

As far as the barbiturates are concerned, I do not use them, although Jameson mentions their use in his recent monograph.

Syphilis in pregnancy should be considered by itself. I think most of us are familiar with McCord's work. The outgrowth of all that work is that the treatment of syphilis in pregnancy is very satisfactory, both early and late. I do not have the exact number of cases but I can say that in all the cases we had in the prenatal clinic, the social service worker who followed them up informs me that for the last five-year period there was not a single case of syphilis in the newborn.

With reference to varicose veins in pregnancy, although I do not treat them by injection I refer such patients for that treatment. It is reasonably safe to inject varicose veins up to the sixth month of pregnancy.

CONGENITAL PYLOROSPASM

(Clinical Observations)

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During the past ten years, I have been interested in obtaining a better understanding of congenital pyloric obstruction. It has been my desire to at least improve my own methods of handling such cases, if not to obtain something which might prove to be of value to others. Seven years ago I presented before this state meeting the results of the first three years of this study.[1] At that time I reported in particular my experiences with the effects of irradiation on the projectile vomiting.

During the past seven years I have continued my investigation of this disorder. As a result of this ten years study I have arrived at certain conclusions which have led to the adoption of certain procedures which apparently give more satisfactory results than did the methods which I had used previously. I would like to report my observations in this paper so that other physicians may evaluate them and if they should like, to make use of them.

Atropine, of course, is a time proven remedy for many cases of pylorospasm. I must confess, however, that I do not find it so consistently effective in relieving the projectile vomiting as do other observers. In some cases it does seem to afford satisfactory relief. Therefore, if the vomiting is not too severe, one is justified in giving atropine a fair trial. I prefer to use it if the patient is breast fed, or for some reasons he is on a 3 hour schedule. I also like to give atropine a thorough trial in those cases in which respiratory and/or circulatory disturbances complicate the vomiting. The drug frequently seems to ameliorate the dyspnea or the cyanosis as well as the gastrointestinal disturbance. I do not, however, believe that it is advisable or safe to try atropine for two weeks as some authors suggest. Nor do I seem able to give such large doses without untoward reactions, as some observers report. An atropine urticaria, or fever, is much less desirable in the private home than it may be in a hospital. In the home such a reaction may prove inconvenient if not embarrassing to say the least.

If within 1 or 2 days or at the most 3 or 4 days the vomiting has not been checked or the baby's condition sufficiently improved I usually discontinue the atropine and use phenobarbital instead. If the vomiting is particularly severe, or if the patient shows alarming signs of dehydration and starvation, or if a gastrointestinal colic complicates matters, I believe that better results are more promptly and surely obtained if one begins with the use of phenobarbital rather than with atropine.

Read before the Pediatricians' Meeting, Eighty-sixth Annual Meeting, Illinois State Medical Society, Springfield, May 19, 1936.

In 1929 Sauer pointed out the advantages of phenobarbital in the vomiting and colic of infants.[2] In 1930, Barnett confirmed Sauer's results,[3] and in 1931, I reported my favorable experiences with the drug.[4] In more than six years experience with its use, I have found phenobarbital quite effective in controlling the vomiting and frequently associated colic and hypertonicity, in certain cases of congenital pylorospasm. In certain cases it gives relief when atropine will not. I have seen no unfavorable effects from its use, even though it may be continued over several weeks. In the dosages usually used the drug apparently acts as an antispasmodic rather than a hypnotic. In addition to being more effective in certain cases than is atropine, phenobarbital has the advantage over the other drug in that the effects of an overdosage are neither so alarming nor apparently possibly as serious as may be those of atropine. The baby merely sleeps. Such a reaction is frequently an occasion of pleasure rather than alarm, on the part of the attendants. Should a manifestation of an overdosage thus present itself, all one needs to do is to let the infant awaken, and then decrease the dosage of the drug. However, with phenobarbital as with atropine, unless one gives enough, that is, to meet the needs or to the point of tolerance, one can hardly expect the maximum benefits. Mention should perhaps be made of the adjunctive value of gastric lavage and gavage in those cases where an excessive secretion of mucus may aggravate the vomiting.

When atropine or phenobarbital fail to bring relief the next procedure most commonly followed is preparation for surgical intervention. I have never been able to become sold on such an idea. Hospitals and operations are distressing and expensive experiences for parents. And because the surgeon gets them so late an operation is frequently a very precarious ordeal for the infants. I have always felt a sense of defeat when one of my little patients required surgical intervention to relieve his vomiting. No matter if one believes, as I know that some do, that pylorospasm and pyloric stenosis are two distinct clinical entities, one must admit that the Rammstedt operation makes the pylorus more patent, by preventing muscular contractures as well as by the incision of the tumor. I feel that so long as we are content with this sort of treatment, just so long will we remain ignorant of the cause, a specific treatment and a means for prevention of this relatively common and at times serious disorder.

In 1931 I summarized my experiences with 37 cases of congenital pyloric obstruction which had not responded satisfactorily to atropine or phenobarbital.[5] In 33 of the 37 cases irradiation of the upper chest seemed to give satisfactory relief. The condition of 4 of the patients failed to respond to this treatment. A Rammstedt operation was performed upon them. Three of them recovered, and one of them died. Although the irradiation did seem to relieve the vomiting of the 33 infants, I was not satisfied with it as a treatment. That type of therapy requires hospitalization and causes almost as much fear and expense to the parents as does surgery. Furthermore one could hardly consider it a specific remedy. I believed and still do believe that when and only when we have learned how this condition really should be handled, that surgery will no longer be necessary to relieve it, and that we will have found the path towards which the true etiology and a means of prevention will be found.

In 1930, for reasons given elsewhere,[6] I began to investigate the possible effects of suprarenal and thyroid gland therapy in certain disorders of infants. Among them was congenital pylorospasm. During the past more than 5 years I have administered whole suprarenal gland without or with thyroid to 54 cases of congenital pylorospasm. In each instance the projective vomiting and associated symptoms were relieved promptly and permanently following this method of treatment. Since 1930, none of my cases have required surgery and none of them have died. That is more than I can say of any previous year of my practice. Surely this must be more than a coincidence. Furthermore, each patient has developed normally, and appears to be in better physical condition than is the average of those who I had treated during the previous years. They seem less susceptible to infections and are more free from the so-called allergic disorders to which these individuals seem so susceptible.

Experience has taught me that except where severe constipation exists it usually seems better when the endocrine therapy is decided upon to initially prescribe the adrenal substance. Should the patient's condition not improve satisfactorily within a day or two following the use of suprarenal gland in optimal dosage 0.06 (gr 1), I have

found that combining thyroid with the suprarenal gland seems to invariably and promptly bring about the desired relief of the vomiting. In those cases which are obstinately constipated thyroid alone in the beginning or thyroid and adrenal gland appears to be the better choice. In either case, either preparation may be given in larger doses and given longer, if the other is given along with it.

The dosages which appear to be more effective are 0.03 (½ gr) and 0.06 (gr 1) of desiccated whole suprarenal gland and 0.008 (⅛ gr.) to 0.016 (¼ gr) of desiccated thyroid gland. As a rule when both glandular substances are given better results seem to occur when they are used in the proportion of 1 part of thyroid and 2 parts of suprarenal. Better results also seem to be obtained if the endocrines are given with or preceding feedings. There doesn't seem to be much danger of overdosage. If too large doses are given, untoward effects soon manifest themselves. With the thyroid gland, urticaria, hyperpyrexia, hypertonicity or diarrhea are definite signs that too much is being given. With such warnings being heeded I never have seen any harmful effects of the glandular therapy. I believe with Lisser[7] and Hoskins[8] that the dangers of thyroid therapy are grossly exaggerated. As Hoskins[8] has said, it is doubtful if any other product is less harmful or more valuable.

The clinical untoward symptoms of adrenal gland overdosage are drowsiness, abdominal pain, constipation, or if used alone when marked constipation exists, an aggravation of the vomiting. Because of the prompt appearance of the above symptoms if too much endocrine material is given, it seems almost impossible to harm one's patients. I at least have never noticed any harmful effects in any of my cases.

Experience is rapidly teaching us the value of supplying infants with adequate feedings. I like to think of them as efforts towards complete feedings rather than merely adequate ones. The more concentrated milk formulae and the early added other foods should supply the baby with a greater abundance of the various food elements which may probably be essential to the optimal growth and development of babies. If this should be true for average infants it seems to me that it should be even more true of those in whom a pyloric obstruction interferes with their food intake. That is one of the reasons why I have long ago discarded the use of thick cereal feeding alone. Breast milk is of course first choice, and every effort should be made to improve and maintain an adequate supply. If one should be inclined to wean his infant patients from the breast because the mother's milk "disagrees with the baby," with the expectations of finding an artificial formula which will relieve the vomiting and at the same time maintain optimal nutrition and development, one will be doomed to frequent disappointments. After a fairly thorough trial of various kinds of artificial feedings, I have come to the conclusion that for all practical purposes, evaporated milk is as satisfactory as any. Evaporated milk is sterile, it is easily prepared, it seems to be as easily if not better assimilated than other kinds of milk. It also has the advantage of being retained and assimilated in relatively large proportions of the various milk components. The use of this kind of milk alone appears to relieve the vomiting in certain cases. However, with this food as with any other, many patients will do better if something is given to control the gastrointestinal spasticity. The frequent changing of feedings "to find one which will agree with the baby" seems to me with this type of patient, to be unsatisfactory and at times disastrous. In my experience, after one has made certain that an adequate supply of breast milk cannot be obtained, if one will feed infants with pylorospasm, suitable proportions of evaporated milk, increasing its strength to the equivalent of whole cow's milk as soon as the patient's condition will permit, give them plenty of vitamins, and as early as possible feed them egg yolk, cereals, vegetables and meats; and if at the same time one will give the babies sufficient amounts of atropine, or phenobarbital, or suprarenal gland or/and thyroid gland to control the gastrointestinal difficulty and therefore enable the patients to retain, absorb and assimilate their feedings in optimal amounts; then, one will find, I think, that the vomiting will practically invariably cease and remain under control, and that one's patients will grow and thrive in a manner which will please all who are concerned.

Although we do not know to what to attribute the effects of the glandular substances it seems to me that the giving of adequate feedings is quite rational. If the action of the endocrines should prove to be that of a drug, the adequacy of the food supply contributes towards the health

of the child. If congenital pylorospasm should prove to be a deficiency disorder, whether the deficient substances be a mineral, or an amino-acid or a compound of both, a hormone or not, the more complete the diet the more it should contain of the essential elements. These babies seem to do better also if they get plenty of cod liver oil or halibut liver oil. Whether this is due to the vitamin content, or some other constituent such as iodine, I of course do not know.

There is just one more thing which I would like to emphasize. That is, that I believe that it is not wise to wait until definite projectile vomiting has set in before taking steps to control the vomiting. I agree with Grulee[9] that no great strides will be made in the control of disorders of infants until the laity and the profession have altered their attitude of indifference towards the so-called minor disturbances of infancy. For example, there is such a common tendency to ignore vomiting by saying "all babies spit up some." That is not true. All babies do not spit up. I do not believe that any healthy infant who is receiving suitable feedings vomits except occasionally. I feel that repeated regurgitation or vomiting is an indication that something is wrong, either with the nature of the food or the baby, or his environment. Here, as in other conditions early, earnest and intelligent efforts toward prevention may be worth far more than later strenuous efforts to cure. If the vomiting does not cease after the formula has been adjusted to one which a baby his size and age should handle, without any difficulty, and his environment has been regulated, I believe that one should give the patient something to control the vomiting. If one follows such a procedure, one will, I believe, have less trouble with cases of congenital pylorospasm, and with congenital pyloric stenosis.

Summary and Conclusion. Atropine is a time proven remedy for pylorospasm in certain cases. In other cases phenobarbital seems to be more satisfactory. Since 1930, whole suprarenal gland without or with thyroid has given prompt and continued relief in 54 cases of congenital pylorospasm. No case has required surgery. Each is alive and thriving. Adequate or complete diets, seem to be of distinct value to these infants if something is given to aid in food assimilation. An abundance of vitamins A and D seem to be especially beneficial.

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DISCUSSION

Dr. Gustav L. Kaufman, Chicago: In discussing Dr. Barbour's paper, which to me was most interesting, it seems first of all one must distinguish between a true hypertrophic pyloric stenosis and pylorospasm. The true hypertrophic pyloric stenosis generally occurs in the male child in the second to the fourth week of life, occurs rather abruptly and is characterized by projectile vomiting, visible peristaltic waves, palpation of the tumor mass, and a typical type of starvation stool. Pylorospasm may occur from birth to four months of age. It generally comes on gradually and may have all the symptoms of pyloric stenosis, except the palpating of the tumor mass.

In most cases of pylorospasm some food goes through the pylorus, and we are able to recognize the result in the stool examination. In the pylorospasm a mass is not felt, and I believe if one feels a mass one is justified in calling the case a true pyloric stenosis. In my belief, the treatment for pyloric stenosis is surgical and the earlier the operation the better results we have.

Of course, I do not mean we ought not to give the youngster a chance for a day or two, especially if seen early and the youngster is in a pretty good condition, by using medicinal treatment. But I believe when youngsters improve by medicinal treatment one is justified in saying it is not a true pyloric stenosis. Very frequently a false sense of security is obtained by the apparent decrease in vomiting. Often the food remains in the stomach for several days causing a dilatation of the stomach and our criterion should be the stool passed. I believe we cannot stress the stool examination enough.

In our experience, all cases except one or two which had been operated upon, showed a definite tumor mass. Our mortality in surgery is very low, probably less than 2%, the good results depending upon the preoperative preparation, fluid under the skin in all cases and in the very dehydrated youngster a blood transfusion. In our experience in the treatment of pylorospasm we

have had the best results with the use of atropine sulphate dilution, one to one thousand, given twenty minutes before each feeding in large enough doses to obtain physiological effect.

I do not believe in Dr. Barbour's description atropine urticaria, or fever, is any less desirable than obtained by the use of other drugs. It is essential to warn the mother of some of the symptoms atropine may give. I am opposed to using atropine sulphate in respiratory disturbances, especially in atelectasis of the new-born. I believe that phenobarbital may have some advantage at times in treating some cases of pylorospasm, but it seems to me it is much easier to increase or decrease the drugs if you use atropine in drop dosage.

It was rather interesting to note Dr. Barbour's results in the use of whole suprarenal gland with or without thyroid. I can readily see the good results when pylorospasm is found in the generally spastic child. Some years ago we took x-ray pictures of the thymus in all our pylorospasm cases. It was remarkable that most cases at that time showed a hypertrophic thymus which x-ray treatment diminished, and also improved the spasm. At present we are unable to distinguish a hypertrophic thymus in pylorospasms, probably due to our newer knowledge in x-ray technic.

In regard to feeding in cases of pylorospasm, I believe with the addition of atropine, we should give a small amount of food at frequent intervals, giving atropine at about four-hour intervals and food at two-hour intervals. In our experience, next to breast milk and in some cases probably better than breast milk was the use of condensed milk dilution of one to eight or one to ten for a short period of time. I believe with Dr. Barbour that frequent changes of formulae is very harmful in feeding children. When one has results with a certain food it is better to stay with such a food than to make frequent changes.

I want to compliment Dr. Barbour on the results of gland therapy and shall follow his results with the greatest of interest. To me pylorospasm is one of the most difficult conditions to handle both from the standpoint of patient and parent. I am generally relieved when I feel a tumor because with operation we can promise the parent a more speedy recovery.

Dr. Ray Armstrong, Champaign: I would like to congratulate Dr. Barbour on his pioneer work in glandular therapy in a condition probably first described back in 1717 by Patrick Blair. My experience with pylorospasm probably does not date back as far as Dr. Barbour's, but I am sticking with phenobarbital, atropin and thick feedings.

A point brought out which I think is very important is not to switch feedings. We have occasionally had cases taken off the breast simply because of vomiting and various mixtures used which is entirely detrimental to the child itself. The important thing brought out is regurgitation. We find with a good many babies the mothers say they vomit or spit but I think the important thing is to get the history than to merely say they spit up or vomit to some extent.

I must confess that in pyloric stenosis I am not always able to palpate the tumor mass. If the child is markedly dehydrated or has lost quite a bit of weight it is quite possible to do so, but the history of projectile vomiting, the waves that go across the abdomen and constipated stool are usually quite diagnostic.

Nothing very much has been said about the x-ray treatment in pyloric stenosis. I would like to hear Dr. Barbour's reaction to that. I think the fact that we find a good many of the cases of pyloric spasm returning in different children of the same family seems to put it on more of a nervous mechanism upset of some sort. I think another important thing is early treatment and early diagnosis especially in cases of stenosis.

If these children have this tumor mass which must be operated on they should be operated on early and given fluids and blood transfusion, if necessary.

In connection with atropin, in the hospital I like to use a drop method but in the homes, due to the fact there is sometimes confusion, especially for different attendants, I prefer to use atropin sulphate, grain 0.02 in three ounces of water, giving a teaspoonful about fifteen minutes before feeding. This can be varied by the mother or attendant more easily than by the drop method.

Dr. Julius Hess: I am showing a few slides of the operation, as I think a large percentage of our mortality in this condition is due to either too much or incomplete operation. Expected results depend largely on the preoperative preparation of these patients. Many are dehydrated and starved on admission and present every indication for hypodermoclysis and blood transfusion. One or more days of preparation is life saving. They should also have a gastric lavage before the operation is started to insure an empty stomach. The child should be fully protected on the table against chilling by the use of warm water bottles, wrapped in blankets to avoid burning.

I had occasion while in Copenhagen some years ago to discuss the treatment of hypertrophic pyloric stenosis with Professor Monrad, Head of the Children's Hospital. He told me they had treated 105 cases of pyloric stenosis without operation. I asked how long they remained in the hospital, and he replied, "Anywhere from six weeks to three months." I asked whether there were any ward infections among the infants. His answer was, "Yes." Some twelve had died of measles. Therein lies the danger of long continued hospitalization. All of us have seen the slow convalescence with chronic dilatation of the stomach and late inanition in the non-operative cases. We usually get them out in anywhere from eight to twelve days and the children remain cured if the patient is well prepared and properly operated on. I am not speaking of pyloric spasm but true hypertrophic pyloric stenosis.

Dr. Barbour has mentioned feeding with evaporated milk. I wish to call your attention to the fact that I believe during the last year I have seen a considerable number of secondary anemias and some infants also showing bone changes, who had been on evaporated milk feedings continuously. I would like to ask your

consideration of such possibilities, secondary to a diet with superheated canned milk products, when they are fed exclusively through the first six months of life without complete protection by the administration of sufficient additional vitamins and iron. It is a question as to whether the super-heated canning and ageing of such foods does not take something out of the milk which the babies need.

Dr. John Bigler, Highland Park, Ill.: The title of Dr. Barbour's paper is pylorospasm, but in the presentation of the paper I do not think he makes clear what he considers the difference between pylorospasm and pyloric stenosis. Any one who has had experience with postmortem examinations of children will have had demonstrated in pyloric stenosis a definite tumor that does not occur with pylorospasm. There is no question but that the treatment of the two conditions is entirely different.

Dr. Barbour has been working for several years, at least, with glandular extracts in the treatment of pylorospasm but as yet we have heard of no other reports on the use of that type of therapy. Everyone still seems to stick with the old time method of thick cereals, condensed milk, atropine, phenobarbital, etc. As far as I know, in disturbances of the thyroid or other endocrine disturbances, especially deficiency of the adrenals, vomiting is not the most prominent symptom as it is in pylorospasm. I would like to have explained what differentiation he makes in the vomiting that occurs with pyloric stenosis, pylorospasm, and the vomiting we see in a great many infants which will clear up without any special therapy.

Dr. Barbour (closing the discussion): There is nothing to be gained by my entering into an argument with Dr. Kaufman about our ideas of pyloric stenosis or pylorospasm. Our opinions represent two distinct schools of thought upon the subject. No amount of discussion is likely to make us agree.

I would like to say just these few words about this much disputed subject. You will probably recall Martha Wollstein's report of her follow-up study of pyloric tumors. I think that her work has not received the attention it deserves. Refreshing our memory, she followed a number of cases, post-operatively and postmortem, on which a Rammstedt or modification of the Rammstedt operation had been performed. In practically every case she found that the incised tumor had not only not disappeared, but had apparently decreased very little if any in size. To my mind her findings represent positive evidence that the neuromuscular spasticity of congenital pyloric stenosis is of at least equal importance to the tumor itself in the resulting obstruction.

We might argue on into the night concerning the relative merits of various drugs in cases of pylorospasm and would arrive at no agreement. Individual experiences vary and so will individual clinical impressions and interpretations. It is probably better, as someone has suggested, for each one to use that particular drug or remedy which seems more effective in his hands.

In the beginning irradiation therapy of congenital pylorospasm was associated theoretically with enlarged thymus. Petersen seemed to disprove that theory. His experimental work seemed to indicate that the effects of the irradiation are probably those of non-specific protein reactions.

Last week in Kansas City I listened to Dr. Rowntree's latest report on his experimental work with the thymus and thymus extract. His work seems epochal, and has recently received confirmation. In his paper Dr. Rowntree reported some observations which are particularly pertinent for pediatricians, and apropos of the subject under discussion. He stated that he had collected a number of children who had had x-ray treatments for symptoms supposedly associated with an enlarged thymus; and who were later retarded in development, physically or mentally or both. In order to obtain more information, by using controls he applied the Roentgen rays to the thymus area of a number of rats. If I remember correctly, practically every one of the treated rats were definitely retarded in their physical development as compared with the control (untreated) rats. Whatever the effects of the rays, it would seem that such treatment is not without danger. I asked Dr. Rowntree if some of his clinical cases might have been constitutionally defective before the x-ray exposure. He replied that he believed that some of them were. In spite of the danger, with our present knowledge, he believes that the rays should be used in emergency cases. It would be better for us clinicians to maintain open minds until our knowledge may become more definite.

I am glad to find in Dr. Armstrong a kindred soul who cannot always find the pyloric tumor. Dr. Armstrong brought up the possibility of familial traits in cases of congenital pylorospasm. That I believe is now rather generally accepted. Dr. Rowntree presented experimental confirmatory evidence on the subject last week.

Dr. Armstrong mentioned another important point, the instability of atropine solutions. Because of that instability and the resulting inequality of dosages, when I desire to use atropine, I have found a 1/1000 gr tablet of atropine convenient and more satisfactory. It seems safer to prescribe 1 or 2 or more of these tablets as the case may indicate, particularly when they are to be given in the home, rather than depending on drops from an unstable solution.

Dr. Hess probably is correct about the possibility of anemia with the use of evaporated milk feedings. Because of a similar impression I have been using egg yolk increasingly early in the life of the infants in order to prevent an anemia. I believe that it helps.

I think my answer to Dr. Kaufman somewhat answers Dr. Bigler's question. Regardless of the opinions of the other school of thought I cannot help but believe that the pyloric tumor is an end-result of the pylorospasms.

While it is arue that projectile vomiting associated with hypertrophied pyloric muscle may occur suddenly without any warning symptoms being recognized, I know of cases in which warnings were present but

were not noticed. Furthermore, I believe that it is not impossible for the pylorospasms to have occurred and recurred and the muscular tumor to have developed in utero or soon thereafter. The eye opening pictures of intrauterine life presented by Dr. Eastman at the recent Academy of Pediatric meeting in Kansas City, tend to verify this viewpoint. I do distinctly feel that in other cases of pyloric stenosis, the symptoms of obstruction appear mildly in the beginning, and increase gradually in severity with the intensity of the muscle spasms and perhaps with the increasing hypertrophy of the pyloric muscle. In either case, I cannot see how the tumor can be anything else but an end-result. I believe therefore that it is not good practice to ignore regurgitation or vomiting in infants, but that one should make definite efforts to control it.

As to clinical differentiation between pylorospasm and stenosis, I do not think that is ever clear cut in anyone's mind. Even the most ardent advocates of surgical intervention advise a trial of dietary and medicinal therapy before resorting to surgery. As Sauer has put it, an increasingly persistent and recurrent projectile vomiting, visible peristalsis and usually an obstipation indicate a congenital pyloric obstruction. If the symptoms are not relieved following an appropriate diet and the administration of appropriate remedies, and if one feels a tumor, then one may probably be dealing with pyloric stenosis. How many cases with a tumor are or might have been relieved without surgical intervention is not known. Wollstein is the only one, so far as I know, who has taken the trouble to investigate that point. Anatomically, pylorospasm and pyloric stenosis are two distinct entities. Clinically they are not so distinct or clear cut.

I am sorry that time does not permit me to reply to the rest of Dr. Bigler's remarks.

A CONSIDERATION OF SOME OF THE MORE SERIOUS CONDITIONS ENCOUNTERED IN THE NEW-BORN

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The high mortality that continues to exist in the new-born period is sufficient justification for renewed discussion of this subject at frequent intervals. More serious dangers threaten the human organism during the first days of its extrauterine existence than in any other period of its life. It is a period of transition in which sudden and profound anatomic and physiologic adjustments are necessary. The ability of the infant to make these adjustments successfully depends chiefly upon three factors: First, its inherent vitality; second, the state of its maturity; and third, the extent to which pathologic processes interfere with normal course of events.

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It is obvious that if we are to hope for a reduction in neonatal mortality, a clearer understanding of the peculiarities of the physiology and pathology of the new-born by all those who have to do with its care is essential. This applies not alone to the pediatrician, but as much or even more, to the obstetrician.

I wish now to discuss some of the more serious problems that confront us in the care of the newborn.

Asphyxia. According to Seitz, 3.5% of all infants are born in a state of deep asphyxia. While some cases of asphyxia are due to local obstruction of the air passages, the majority result from a depression of the respiratory center. The factors involved in this state of depression have to do with the oxygen and carbon dioxide content of the blood and the cerebral blood flow. The significant part played by intracranial birth injury in the etiology of severe asphyxia is well recognized. In the premature infant, we have the additional factors of immaturity of the respiratory center and weakness of the muscles of respiration. Keeping these factors in mind, we can more intelligently consider the methods of resuscitation. Before any method of resuscitation is undertaken, it is essential that the air passages be cleared of foreign material by means of a soft rubber catheter. This is most important, not only for the purpose of removing obstruction, but also to avoid the aspiration of this foreign material into the lungs, with the danger of a subsequent pneumonia. What method of resuscitation shall we use is the next question?

(a) Body manipulations are usually more likely to do harm than good and should, in general, be avoided. This is especially true of the Schultze swinging method.

(b) Temperature stimulation, when performed in the proper manner, is a valuable measure for resuscitation. The infant should be carefully submerged in a basin of *warm* water, several degrees warmer than body temperature, while the resuscitator flicks cold water on its chest from time to time. This procedure should not be continued for more than a few minutes, and every care should be taken to avoid chilling.

(c) Resuscitation with air or its constituents.

1. Mouth to mouth insufflation is an old and

valuable method. Its chief drawback is the danger of bacterial contamination of the infant's respiratory tract.

2. Administration of oxygen and, more recently, of oxygen and carbon dioxide mixtures by various methods is now more commonly in use in hospitals than any other method of resuscitation. Whether the addition of carbon dioxide is an advantage over the administration of oxygen alone in the type of asphyxia we are usually dealing with in the new-born is still a question in the minds of not a few.

(d) The Drinker respirator, as a means of inflating the lungs and mechanically carrying on the respiratory function until the normal mechanism is well established, is now in rather wide use in hospitals. It is an electrically operated negative pressure apparatus equipped with controls for the rate of respiratory movements and for the amount of negative pressure produced. There are certain dangers connected with its use, and the advantages claimed for it are not indisputable. It is expensive and, in my opinion, by no means indispensable.

(e) Medical stimulants in many forms have been tried; of these Alpha Lobelin is the only one that has seemed to stand the test of time. It should be tried in severe cases where a specific stimulant of the respiratory center is indicated.

Intracranial birth injuries constitute the most serious of the pathologic conditions encountered in the new-born period. Intracranial injuries may be due to many factors, and this multiplicity of factors working together must be kept in mind in any consideration of the etiology of these injuries.

1. Direct mechanical influences on the infant's head:

(a) Resistance imposed upon the on-coming head.

(b) Intensity of the pains.

(c) The time of rupture of the bag of waters in relation to the stage of progress of the labor is important in its effect upon these mechanical factors.

2. Disturbances of circulation produced within the cranium during delivery (local congestion and stasis) also ("cupping action").

3. Disturbances of the general circulation during pains which give rise to intrauterine asphyxia and to asphyxial stasis. This is most common in breech deliveries. They may be put in the form of an equation: Mechanical factors plus asphyxial stasis equals more easily ruptured blood vessels.

4. Friability of the blood vessels and vulnerability of the brain substance. This factor is of particular significance in premature infants.

It is evident from this enumeration of the principal causative factors that intracranial injuries are by no means always the result of faulty obstetrical judgment or skill; it is, on the other hand, also evident that first class obstetrical care for every mother can reduce the probabilities of occurrence of this injury to the absolute minimum.

The recognition of intracranial injury when it occurs, and the institution of proper care and treatment are the next steps.

Many of the asphyxial deaths that occur at birth, or soon after, are due to intracranial injuries. Serious intracranial injury is unlikely if the child has cried lustily after being resuscitated.

Somnolence is a common early symptom. It differs from the sleepiness of normal infants in that the normal psychic reactions are absent (defense reactions, demands for food, Moro reflex). *Flaccidity* is a symptom in the severe cases that die within a short time. *Increased muscle tonus or hypertonicity* is much more commonly seen. *Convulsive attacks* during the new-born period are practically always due to cerebral trauma. There may be only mild rhythmical muscular twitchings or there may be generalized tonic or clonic convulsions. *Respiratory disturbances* are not infrequent. *Trismus* is present in some cases.

While the symptomatology may be quite varied, the clinical picture as a whole is rather uniform; it is dominated by a clouded sensorium and evidences of motor irritation.

The symptoms may sometimes be latent, particularly in the premature.

The treatment consists in good nursing care with emphasis on a minimum amount of handling, the administration of blood intramuscularly to promote coagulation and, finally, the avoidance of meddlesome examinations and treatments. Lumbar and cistern punctures have a very limited value, whether done therapeutically or for diagnostic purposes. When there are signs of marked increase in intracranial pressure (severe convulsions, respiratory difficulties and a bulging fontanel) the removal of 20 to 40 cc or

more of cerebrospinal fluid will often give at least temporary relief.

Atelectasis. Since complete inflation of the lungs is probably not accomplished in the normal infant until several days after birth, there must be a certain degree of physiologic atelectasis for a period of time in all new-borns. Sometimes hindrances to respiration result in the persistence of atelectasis in large portions of the lungs. Continuous or intermittent cyanosis may be the result, and infants thus affected frequently die. Atelectasis, as a cause of death, is a generally accepted diagnosis, and while it is the direct cause of the anoxemia and resultant death of the child, unless we can determine what caused the atelectasis, our diagnosis is not complete. Some of the fundamental causes of atelectasis are: Injury to, or immaturity of, the respiratory center; bronchial obstruction due to aspiration of amniotic fluid, mucus or blood; poorly developed thorax and weak thoracic musculature, as is seen particularly in premature infants. The treatment of severe atelectasis, therefore, must be symptomatic, unless the cause of the atelectasis is known and can be treated. In the main, our efforts are directed toward the stimulation of breathing and administration of oxygen.

Hemorrhagic Disease of the New-born. There is a prolongation of the bleeding time and the coagulation time in nearly all new-born infants during the first three or four days of life. This physiologic peculiarity may assume pathologic proportions and result in more or less serious spontaneous bleeding. While hemorrhage may occur from the skin, the mucous membranes or into various tissues of the body, that which occurs in the gastrointestinal tract is most common and may assume serious proportions. Vomiting of blood or the appearance of blood in the stools is always a danger signal, and calls for immediate treatment. The simple method of giving twenty to thirty cubic centimeters of whole blood intramuscularly, and repeating the dose in twelve hours if necessary, is in wide use and quite satisfactory for the majority of cases. Rarely, there are cases so severe that direct transfusion is necessary. It is no doubt true that many mild cases will be cured spontaneously, but it is not advisable to take this chance when we have such a simple and harmless method of treatment at our disposal.

Hemorrhage into the Suprarenal Gland. It has long been known that there is a special tendency for small hemorrhages to occur in this gland. Symptoms are usually absent. Occasionally, however, massive hemorrhages occur which give rise to symptoms of shock. The infant becomes very pale and the skin is cold, there is pain on handling and a tumor can frequently be felt in the kidney region. Rupture may occur into the soft tissues of the back or into the peritoneal cavity, in which case death occurs quite suddenly. If, however, the blood tumor does not rupture, the child may live and eventually be quite normal or may have symptoms resulting from destruction of the suprarenal cortex.

Hemorrhage into the brain may also occur and give rise to symptoms almost indistinguishable from those due to birth injuries.

Infections. Serious conditions due to infections occur in the new-born with comparative infrequency in these days of almost universal application of aseptic technic in obstetrics and in new-born care.

Infections of the skin will occur now and then even in well regulated nurseries where strict aseptic technic is practiced. The commonest type of pyodermia consists of a few isolated pustules which may appear anywhere on the body, but are more frequently seen in the inguinal region, flexor surfaces of the thighs, axillary spaces, and in the skin creases of the neck. The skin surrounding the pustules is slightly reddened as a rule. Several small pustules may coalesce to form larger blebs or bullae. Usually the course of the infection is quite benign and unaccompanied by any general symptoms, but in true epidemics an occasional case may exhibit a malignant form and have a fatal outcome. Such cases have large bullae which coalesce into extensive areas of epidermolysis. When this happens, the epidermis may be shed from a great part of the body surface leaving the raw, red, and moist dermis exposed. We call this condition *Dermatitis Exfoliativa Neonatorum* (Ritter's Disease).

Prophylaxis is, of course, the most important consideration in the treatment of skin infections. An appreciation of the delicate texture of the newly born infant's skin, and a realization of the trauma which even the most careful handling, bathing, and clothing must cause is, in my opinion, as essential as good aseptic technic. If trauma is carefully guarded against, the skin will not easily become infected where there is reason-

ably good aseptic technic. Immediate isolation of every infant with pustules is imperative. The active treatment consists of antiseptic baths and the application of various antiseptic solutions to the lesions.

Infections of the respiratory tract are very serious in the new-born, because they spread rapidly to the bronchioles and the alveoli and produce capillary bronchitis and pneumonia. Rapid breathing and dyspnea occurring in an infant that had previously appeared well should always arouse suspicion of pneumonia. Fever is by no means always present. In addition to dyspnea, the infant has a dusky pallor, refuses food and loses weight rapidly. Very little except symptomatic and supportive treatment can be given and the mortality rate is high. Here again prophylaxis is all-important and every effort should be made to shield the new-born from contact with individuals who have common colds or other infections of the respiratory tract.

Infectious enteritis is another serious condition that now and again occurs in epidemic form in nurseries for new-borns, and often with tragic results. Here the infection is due to contaminated milk or other fluids given as food or drink. A short starvation period followed by breast milk alone will usually result in a cure. Here again it is necessary to strictly isolate all infants that have diarrhea and immediately institute a most thorough search for the source of the infection.

Infection of the salivary glands is rare, but occurs with sufficient frequency to warrant consideration. The parotid is more frequently affected than the submaxillary, according to statistics published, but I have personally seen it occur more times in the latter gland. Infection probably occurs by way of the excretory duct from a contaminated mouth cavity. It is usually unilateral, but may be bilateral. Suppuration almost invariably results. Spontaneous drainage may occur through the duct with complete recovery, or the abscess may have to be incised. Recovery is the rule, but general septico-pyemia may result with a fatal outcome. Premature infants are more frequently affected than full term infants.

Tooth bud infection is quite a rare condition. The first thing to be noted is a swelling of the lip and cheek on one side associated with fever. On examination of the mouth cavity, one finds a swelling of the alveolar process of the maxilla or of the mandible, usually at the site of the first molar. Within twelve to twenty-four hours the tooth crown is extruded and there is drainage of thick pus from the underlying tissues. Nearly always there develops an infection of the maxilla, the maxillary sinus is infected and pus drains from the nose on the infected side. Orbital cellulitis often occurs and, if the patient survives, sequestra may be extruded from the infraorbital area or from the bony palate into the mouth. Of the cases recorded in literature, about 50% have recovered and 50% have died from general sepsis.

Septico-Pyemia of the new-born was, before the period of asepsis, one of the most frequent causes of neonatal deaths. Infection gained entrance through the umbilical wound in the majority of cases, quite often through the mouth cavity, when the practice of washing out the mouth was in vogue, and also through infections of the skin. General sepsis is characterized by persistent fever, loss of weight, anemia, often severe icterus coming on late in the neo-natal period, hemorrhages into the skin and mucous membranes, lesions of multiform erythema, and later, if the infant survives the early stage, there may be osteomyelitis in one or more locations.

Icterus Neonatorum Gravis. When an infant is icteric at birth or develops icterus within the first day, we are usually dealing with a serious condition known as icterus gravis. The color becomes progressively more intense until it is a deep yellow-green. The general condition of the infant becomes poor and death usually occurs within four or five days. A constitutional peculiarity may be the cause; more than one child of a family may die from this disease, and recently, some at least of these cases have shown the condition known as erythroblastosis of the new-born. The condition has to be differentiated from congenital atresia of the bile ducts. Blood transfusions may be of benefit and should be given a trial.

Congenital malformations are sometimes very serious, and since most of them are not amenable to treatment, mention will only be made of them.

Congenital atresia of the esophagus and of the gastrointestinal tract at other levels.

Congenital heart lesions.

Hernia into the umbilical cord. This condition if operated upon immediately may be cured.

Brachial plexus injuries almost always subside spontaneously. In some instances where there is

evulsion of the nerve roots, permanent paralysis of the arm results.

Injuries to the spinal cord may occur and lead to permanent paralysis of the body supplied by the nerves given off below the lesion.

Fractures of the humerus or of the femur seem more serious than they really are. In spite of the difficulties of proper reduction of the fragments, healing almost always occurs without deformity.

Prematurity is the most important cause of death in the neonatal period, and deserves to be treated as a separate subject. The general principles of the care of the premature have to do with regulation of body temperature, nutrition and avoidance of infection. In general, the prognosis for the premature infant depends upon the stage of his physiologic maturity, the degree to which his health may have been influenced by the condition which caused the onset of premature labor in the mother, and the kind of care he gets after he is born.

DISCUSSION

Dr. Clifford G. Grulee, Chicago: I think those last remarks are about the most timely I have ever heard. I do not believe one-half of the cases diagnosed intracranial hemorrhage in the newborn are intracranial hemorrhage. I think the vast majority are either cases of edema or cases of agenesis or lack of brain development. Another point which Dr. Parmelee brought out which I think we will have to consider at the present time or in the not distant future is the effect on the child of the use of various sorts of anesthetics and other drugs given to the mother during the time of delivery. The effect on the child is marked in many instances and we must consider that in the use of such drugs the time is coming when the obstetrician is not going to be imposed upon by the mother because she is going to see she will have to stand a certain amount of pain during delivery in order to have a normal child and in order herself to be normal. That was brought out very definitely in the discussion in Kansas City but not brought out from a pediatric standpoint. From the standpoint of the children there are some drugs that are dangerous.

PHYSICAL IMPAIRMENTS OF DEAF CHILDREN

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The problem of deafness is an important one and has received little consideration from the general practitioner, pediatrician or specialist, until the last few years. For centuries the deafened patient was considered a hopeless problem. The child of school age, who could not hear, was usually placed in the dunce class or else relegated to a seclusion which made life almost unbearable. In those tender years it is impossible for him to appreciate that he is suffering from a definite handicap. He does not know that the piece of skin hanging in many folds on the side of his head has any purpose other than to provoke daily, or more often, washings, inspections, and scoldings from his mother. Until recently there was no concern, neither child nor parent nor doctor appreciated the seriousness of the condition. Draining ears usually received some consideration, but this was confined to an attempt to stop the discharge.

To such men as George Shambaugh, Gordon Berry, Harold Hays, Karl Menninger, Maurice Sorsby and others we must give credit for focusing attention on the problem and arousing such interest as will in time relieve at least a part of these 3,000,000 unfortunate children.

In a survey of 58 children entering the Illinois School for the Deaf during the present school year we have found that 33 or 56.9% were coming to that institution as a result of acquired deafness and 23 or 39.65% were congenitally deaf. This is a somewhat higher percentage of acquired deafness than is usually found. (2 of this group were not deaf.)

A congenitally deaf child may be the victim of frankly hereditary forces or of an obscure lesion. Graham Bell in 1883, in his memoir on the "Foundation of a Deaf Variety of the Human Race" focused attention on the hereditary deaf-mutism problem. Bell pointed out that more than 50% of the congenital deaf-mutes had deaf-mute relatives. Owing to the constant intermarriage between deaf-mutes, and the fact that speaking and hearing members of such families often have deaf-mute children, he foresaw a deaf variety of the human race. From an analysis of the deaf-mute population of the United States, from the end of the 18th to the latter part of the 19th century, Bell concluded that the congenital deaf-mutes were increasing at a greater rate than the general population. In all forms of congenital deafness, treatment is practically useless. The problem presented is one of education.

It cannot be emphasized too strongly that most deafness is partial and acquired. There is an old adage about there being two types of deafness;

Read before the Pediatricians Meeting of the Illinois State Medical Society, May 19, 1936, at Springfield.

one (curable) is due to wax in the external ear; the other (incurable) is sent to the otolarngologist. Fortunately this pessimistic teaching is no longer true. But all types of deafness are more easily prevented than cured, and the efforts of prevention of deafness cover the entire field of biological activity.

We are all interested in the etiological factors in these deafened children. The causes in this group are not greatly different from the causes reported by Shambaugh, nor do they vary essentially from those given in my own report in 1932. As in all reports meningitis heads the list—being responsible in this group for 9 or 27.2%; second place is taken by whooping cough being the cause of 6 cases or 18.1%. All those deaf as a result of whooping cough were deafened before 1½ years of age. Third place goes to measles causing 4 or 11.8%. Scarlet fever was fourth causing 2 or 6%. Following these "Big Four" we find a variety of causes, such as, congenital syphilis, undiagnosed fever, mastoiditis, otitis media, skull fracture, head injury, typhoid fever and summer complaint.

It is interesting to note that 73% of this group became deaf before 5 years of age and that 64% were deafened before the age of 2 years. Of those under 2 years of age whooping cough and meningitis were each the cause in 28.5% and measles in 9.5%.

Childhood is rightly regarded as the most precarious period in life as far as the ears are concerned. It is during the pre-school age that the child's health should be particularly safeguarded. The belief still prevalent among many mothers that the young child should be exposed to the infectious diseases of childhood, for example to measles or whooping cough, in order to get it over with is a serious mistake.

The infectious diseases cause deafness in three ways. By spreading infection of the nasopharynx, acute otitis media and all its complications, including acute mastoiditis, may be set up. A blood borne infection may similarly affect the middle ear. A third way is toxic neuritis or meningitis which destroys the inner ear or eighth nerve as typically seen in cerebrospinal meningitis, but not uncommonly seen in measles, scarlet fever, whooping cough and other infectious diseases. Destruction of the inner ear and eighth nerve causes complete deafness and is a rapid process; affections of the middle ear generally subside without permanent damage, but if neglected may go on to chronic middle ear diseases and all its dire consequences. The control of infectious diseases and skilled aural attention when complications are present will do much to diminish the frequency of deafness from these causes.

This group of 58 children studied from the viewpoint of general physical defects, exclusive of deafness presents an interesting challenge. A challenge which must be accepted by the general practitioner and the pediatrician if we are to accomplish improvement in the general welfare of our children. Ninety per cent of this group showed some physical defect besides that for which they were admitted to the school, 80% showed some defect which necessitated medical attention. These were in order of frequency: 1. Tonsilitis, associated with marked enlargement of cervical lymph nodes, reddened anterior pillars and cryptic hypertrophied tonsils; 2. Malnutrition, sufficient to justify careful attention to weight and diet. 3. Rickets both healing and active, as manifested by the presence of beading of the costochondial junctions, pigeon breasts etc. 4. Rheumatic heart disease. 5. Chorea. 6. Congenital syphilis, and 7, other conditions such as hydrocephalus, curvature of the spine, mental deficiency, and colloid enlargement of a goiter.

Of the group who were deafened by 2 years of age 100% showed other severe physical defects. Careful physical examination of these children revealed the more serious impairments such as rheumatic heart disease, extreme deformities due to nutritional diseases of infancy, such as marked pigeon breasts, and pot belly and dental caries resulting from calcium and vitamine deficiency and the changes in the chest that denote old chronic upper respiratory infections.

It is interesting to relate here a report of one of this group:

J. L. D. Born February 15, 1929, admitted to the school in September, 1935, at the age of six. His mother states that he was a full term baby, born spontaneously without difficulty. She also insists that his infancy was uneventful, cut his first teeth at 6 months, walked at 12 months, and talked at 18 months. He was artificially fed after the first two months of his life.

At 2 years of age, in April, 1931, he had pneumonia and meningitis causing his deafness. In September, 1932, he was run down by an automobile, but suffered no serious injury. In December, 1932, he had scarlet fever followed by acute nephritis. In February, 1933, he had a tonsillectomy and adenoidectomy. In August,

1933, he had whooping cough severely. His mother says the doctor feared he would not recover. In September, 1934, he dropped a match in a tank of gasoline and was severely burned about the face and neck causing considerable scarring. In February, 1935, he had german measles without complications. In June, 1935, he was bitten by a dog with lacerations about the face and arms necessitating anti-rabies vaccine.

Is it any wonder that when this youngster entered school last fall he was underrourished, anemic, had a marked pidgeon breast, and pot belly, that he had marked scarring of the right upper lobe of his lung (all this in addition to being deaf), in fact he looked as though a good strong breeze would blow him away. It is, I believe, providential that he had been immunized against diphtheria and had a negative Shick test, a negative Manteaux test and a normal urine.

This case is described as a sample of the condition of some children when we receive them.

The prevention of these physical defects antedates school age by 5½ or 6 years. Proper care in infancy including feeding, vitamine administration, etc. will do much to improve the health of these babies. Combine this with immunization against those diseases for which we have active immunizing agents, diphtheria, scarlet fever, smallpox and whooping cough and much will be accomplished toward the perfect development of our children. And last, but not least in importance, must we consider early diagnosis of the infectious diseases with prompt administration of antitoxins, vaccines, and antisera in almost every instance. Administration of these agents, if not to effect a cure of the disease, to at least prevent the dire complications which are so frequently more serious than the disease itself.

When compared with the report of G. Koehler of the children in the Springfield, Illinois, Public School system in 1933 we find 80% showing severe defects requiring medical attention instead of the 50% reported by him.

It cannot be emphasized too strongly that it is of greatest importance for the welfare of the child, from the standpoint of his general physical well being as well as his ears, that he be kept in the best possible physical condition. It is not surprising that, proportionately, there are more defective children among the lower classes where nutritional disorders are common and where children are allowed to go out in inclement and severely cold weather with far too little clothing. Knowing that the resistance of a child is of paramount importance in warding off infections, one can readily realize that the nose, throat and ears are easily infected, when the resistance is low.

These defects including deafness, like blindness, are caused by a multitude of diseases, but both are largely the result of sepsis. The great causes of blindness were smallpox, trachoma and ophthalmia neonatorum. These three powers of darkness have been practically stamped out in this country. The great causes of deafness are likewise septic processes, middle ear infections and destruction of the internal ear from infectious diseases. It may be beyond the resources of modern otology and epidemiology to stamp out nasopharyngeal infections and the infectious diseases, but much has been done and still more can be done. Within the province of the general practitioner and pediatrician lies the early infection of the middle ear. Many of these infections need never occur if the nasopharynx of the healthy child is not allowed to become a center of latent sepsis. When the conflagration in the nasopharynx has started and has spread to the middle ear, it is well to remember that it is not a minor condition which is being dealt with, but an insidious threat to hearing and even to life. Much marring of life can be prevented and much happiness brought about by the prevention of the development of acute inflammation of the ear and when that catastrophe has occurred, by preventing it from becoming a chronic menace or an irremediable calamity.

DISCUSSION

Robert Cook, Springfield: Doctor Drennan's paper is interesting because it is practical; it is practical because it points specifically to the causes of deafness and indicates how they may be prevented. His paper merits additional appreciation since it is based on personal observation and study.

When we think of children handicapped by hearing difficulties, we immediately relate the child thus affected to the learning processes. We are frequently told that 80% of our learning comes through the organs of vision, and yet some very good authorities contend that deafness is a disability causing a greater learning handicap than blindness.

It must be evident to all of us that mild and medium hearing difficulties have not in the past caused any great concern on the part of parents; this is possibly due to the fact that physicians have not generally manifested the concern that the condition warrants. It is interesting to note that Doctor Drennan found 64% of children with acquired deafness were thus affected before the second birthday and that 73% before the fifth birthday. These findings are almost identical with the findings of Doctor Shambaugh, who reports that out of 2,014 with acquired deafness, 61% came to this

grief before they were three years of age. It may thus be summarized that the danger zone for loss of hearing is before ten years of age.

Doctor Drennan has pointed to the causes: poor nutrition, poor hygiene, neglect of the nasopharyngeal region, the acute infectious diseases of childhood, fevers of known or unknown origin. It is significant that meningitis heads the list of causative factors among the acute infections and that whooping cough, measles and scarlet fever are, in the order named, responsible for additional high percentages of deafness. This is ample warning for renewed vigilance against the infectious diseases of early childhood.

Our problem may be stated thus: 24,000,000 public school children in the United States; of this number, according to the most reliable surveys, 14% or more than three million have some degree of hearing defect.

The solution of this problem depends first, upon the diagnosis—knowing the causes (these Doctor Drennan has pointed out); second, upon an increased interest on the part of doctors and public health workers; and third, upon greater understanding on the part of the parents.

There is also indication for more thorough testing for hearing acuity of school children. The 4A Audiometer is apparently the device of choice for making these tests and should be in more general use than it is at present. A large percentage of impaired hearing can be helped if remedial measures are undertaken early.

We have parents interested in almost every phase of child health except hearing difficulties to which little attention is paid, but perhaps all that is needed to bring this subject into the open is to place in the hands of the parents a reprint of Doctor Drennan's paper.

The following letter under date of May 8, 1936, from the County School Nurse of Stephenson County to the State Department of Public Health indicates the need for the type of information contained in the paper to which we have just listened:

"OFFICE OF
COUNTY SUPERINTENDENT OF SCHOOLS
STEPHENSON COUNTY
FREEPORT, ILLINOIS

May 8, 1936.

State Department of Public Health,
Division of Child Hygiene,
Springfield, Illinois.

Dear Sir:

Can you tell me where I can secure a good, simple discussion of the causes of defective hearing in childhood?

I would like to either secure reprints of such an article or make mimeographed copies for parents of children with defective hearing. Many of our parents consider defective hearing very lightly if at all. We have distributed material on various phases of child health this last year with good results, and considerable interest has been shown by parents. I think some material on defective hearing in childhood might bring the parents of these children to a better understanding of this problem and point out the dangers of neglect.

Yours truly,
Martha Speer, R. N.,
County School Nurse."

BREAST FEEDING

CLIFFORD GRULEE, M. D.
Chairman
CHICAGO

The Chairman: In introducing this subject, I want to say I think one of the most abused things in medicine today is the question of breast feeding, abused by not being insisted upon. We have gained the idea because we have learned something about the artificial feeding of children that we can go ahead and feed them artificially with impunity, get away with it and the children will be as well off as before. That is the reason for my statistical chart. Many of you have seen them once or twice before, but I think they do have a certain definite meaning in that they show pretty conclusively that the question of breast feeding does have its effect on mortality of infants in the first place and in the second place that it is not merely the physical nutrition of the child that is important but also its protection against infection.

. . . Showing of slides of the statistical chart. . . .

The Chairman: Objection has been raised to this by some, saying it represented a survey in a poorer class of people and could not be duplicated in other walks of life, but I call your attention to the fact the mortality statistics are just about one-fourth what they are in the whole city of Chicago. That is instead of being about 45 they are 11 per thousand, which shows this group is not in such a bad way from the standpoint of care and nutrition. I believe if we had statistics comparable to this in the better classes we might not duplicate them, but would find the general trend to be very much the same; that is, that breast feeding does protect these children against infection, infection in general, not any one type of infection. Respiratory, gastrointestinal or unclassified infections are all equally affected in a general way by breast feeding.

Round Table discussion at Pediatricians' Meeting, Illinois State Medical Society, Springfield, May 19, 1936.

RELATION TO SUPPLEMENTARY FEEDING IN THE NEWBORN

H. G. Poncher, M. D.
CHICAGO

There are two medical aphorisms which summarize the basic principles of feeding the newborn infant. Some thirty years ago, Oliver Wendell Holmes declared that, "A pair of substantial mammary glands have the advantage over the two hemispheres of the most learned professor's brain in the art of compounding a nutritive fluid for infants." The text to that aphorism has been supplied by Dr. Grulee. While the dictum was truer 30 years ago, the data presented by Dr. Grulee shows that in spite of our scientific advance it is still true today. The other aphorism is a product of mature reflections of Dr. Abraham Jacobi and expresses in a sentence what I have been allotted 10 minutes to discuss, "In the absence of an adequately secreting pair of breasts the most important ingredient in the infant's formula is the physician's brains."

Cow's milk has been modified in almost every conceivable manner. It has been reinforced with various carbohydrates ranging from starch to the simplest monosaccharide. All of these methods have been used successfully in the artificial feeding of infants when certain basic principles of infant feeding have been fulfilled. They may be briefly restated as follows:

1. The formula should be adapted to the digestive tract of the infant at his particular stage of development;

2. It should contain adequate protein, fat, carbohydrate, minerals, water and vitamins;

3. It should be calorically sufficient and be fed in amounts and at intervals suitable to the individual needs of each infant;

4. It should be bacteriologically safe and chemically clean.

It is apparent, therefore, that successful infant feeding is a matter of the judicious application of feeding principles and not the supremacy of any one formula. The principles elaborated are those found incorporated in successful breast feeding.

The newborn period may present a special feeding problem when breast milk secretion is retarded or diminished or where nursing vigor is diminished by birth trauma or prolonged anesthesia. Boiled water is one of the first articles added to the diet. There appears to be a divergence in opinion as to whether water should be given plain, with gelatin, with various sugars and salts, or as weak cow's milk dilutions until adequate breast secretion is established. There are the groups who fear dehydration and inanition fever, and in most cases with justification, especially in infants born of primiparous mothers; others who desire to prevent starvation ketosis and acidosis, a few who are combating "birth shock" and still others who treat the product of their own hypothetical speculations. I do not mean to minimize the excellent chemical and metabolic contributions made to the subject of neonatal nutrition but it would appear that such information should be used to clarify our clinical experience rather than replace it. While we would all readily admit the necessity of preventing dehydration and its sequelae, no one has yet presented unequivocal evidence that an excess of fluid in the tissues is any advantage to the newborn infant. Yet, recent investigations have shown that many of the hydrating solutions advised for the newborn do that specific thing.

Time does not permit a thorough discussion of the subject of pre-lacteal feedings. That carbohydrate is desirable after the first 24 hours in the newborn period was indicated by the studies of Murlin and his associates on the respiratory quotient of the newly born. The choice of the carbohydrate used in the mixture seems to make very little difference except that sweet sugars tend to take away some of the zest for breast feeding. The concentration of sodium chloride or citrate in the mixture will determine whether the tissue hydration will be expressed clinically as generalized edema or a superior weight gain. For those who prefer a hydrating salt in addition to water and sugar, attention might be called to the fact that they have an excellent source in colostrum. (The sodium content of colostrum is about twice that of mature breast milk).

The entire subject may be summarized by stating that any method of pre-lacteal feeding is desirable that prevents dehydration and hypoglycemia when the conditions for their development are present and that does not send the infant to the breast with the feeling that it is a marked contrast to the easy flow of nutrient from the bottle. The latter stipulation is important for many babies have been unnecesarily weaned from the breast because of the injudicious use of the

pre-lacteal feeding. If we admit the truth that breast milk is the most desirable nutrient for the newborn, then our chief aim should be to conserve the maternal milk supply. Since our best galactagogue is a vigorously nursing infant, any measure which defeats this nursing vigor is an unconscious gesture at weaning. The question of feeding the newborn resolves itself into basic principles and not in the adoption of any favored solution or formula. Any feeding method undertaken with a clear vision of the ultimate goal of the infant's nutrition will be successful. The proof of the latter statement is attested by the fact that newborn infants thrive in all parts of the world with varied feeding methods in the hands of intelligent physicians.

It would seem, therefore, that the most vital factors in the successful feeding of the newborn are the integrity of the mammary glands of the mother and, in their failure, the cerebral cortex of the physician.

The Chairman: I might say in discussing this presentation of Dr. Poncher that for the last six years at the Presbyterian Hospital Dr. Sanford, of Chicago, has been making studies with respect to things that influenced the question of breast feeding in the mothers. Our attention was called to this largely by the fact that we found the mothers of the outpatient newborn had a very much larger proportion of children on the breast at the end of the lying-in period than did the ones in the hospital. We started out in several different ways. One of them was by giving the babies full feedings, complemental feedings, then nothing at all. Finally, for the last two years, they have been given nothing but water. We found that not only does it not affect the weight curve materially except to cause a lower dip and more rapid rise but that our number of breast feedings has increased as far as we can estimate (now inaccurately) from about 40 to 85 per cent.

PUBLIC HEALTH POINT OF VIEW

HENRY C. NIBLACK, M. D.
Chief, Bureau of Child Welfare, Board of Health
CHICAGO

Along with the typhoid rate, the infant death rate is one of the chief criteria of the efficiency of the health service of a community. Therefore believing as we do and as Dr. Grulee has shown, that breast feeding is one of the most important factors in protecting the health and lives of infants, health organizations, both public and private, are vitally interested in this type of feeding.

From the public health standpoint, promotion of breast feeding is an educational procedure. In this procedure these factors are concerned: the educators, applying certain subject matter through various methods, to the subject, with a hoped for result in view. In this instance the educators are the physician, whether he be obstetrician, pediatrician, or general practitioner, the nurse, the social worker, the hospital, and other agencies such as the infant welfare conference; the subject matter is breast feeding, in the teaching of which there are as many methods and as many varying degrees of knowledge and enthusiasm as there are educators; the subject is the mother—and the baby, because the baby, as well as the mother, must be educated; the result is usually a confused mother and a bottle-fed baby. What else can be expected of an uninformed mother placed in the midst of these impinging and conflicting opinions and methods?

I am glad that one speaker stated this morning that we, the physicians, are a part of the public health fabric. I think it is we who must assume the chief responsibility. In speaking of the part of the hospital, I realize that it is impossible to separate the responsibility of the hospital from that of the attending staff; but there is a definite attitude in the atmosphere of the hospital felt by the mother that helps to influence her course of action. If every one in the institution believes in breast feeding, talks breast feeding, and if breast feeding is actually carried out, the mother develops the same spirit and enthusiasm.

The interns and student nurses are affected in a like manner. They are not trained to teach mothers the art of breast feeding; they are not led to have any strong conviction in the matter; they go out to practice; may become, in turn, members of the hospital staff, responsible for the training of following groups of interns and nurses; thus a vicious circle is created.

I am interested in the infant welfare activities of the official public health organization of the city much in the same way that Dr. Grulee is in those of the private organization. We have a group of attending physicians and nurses carrying on much the same type of work in the same way. We hold these physicians strictly responsible for keeping the babies under their direction breast fed. We cannot check every baby registered, but we can check the deaths. If a baby dies and it is found not to have been breast fed,

we want to know why; if that baby had been taken off the breast, we want to know the indication.

The infants' records are kept on colored charts; the yellow indicating breast-fed babies and blue, artificially fed. We expect a file to be predominantly yellow; if there are too many blues, we expect an explanation. When these matters are taken up with the attending physicians, their argument is: "The baby was put on a bottle in the hospital and so discharged; when the baby is registered he is already in the habit of having a bottle, and the mother of giving it." Overcoming the bottle habit of these two individuals is most difficult.

I am sure that too many babies are being discharged from the hospitals on unnecessary bottle feedings. In many instances giving these feedings is a matter of nursery routine; formula number one, two or three, being given to the infant at the discretion of the nursing staff. The physician must personally assume the responsibility of directing the feeding of the new-borns and determine the policy of the hospital regarding the procedure. There has been too much stress on the idea that there must not be an initial loss in weight; this unjustifiable fear is responsible for many artificially-fed infants.

A year ago we made a city-wide survey of the breast feeding situation from the standpoint of the hospitals; that is, we wanted to find out, as accurately as possible, what kind of feeding babies were receiving when discharged from the hospital—if the infant welfare physicians were justified in their contention that the hospitals were responsible for the great number of artificially-fed babies. In Chicago, a nurse from the Board of Health delivers to the mother a notification of the registration of the birth of her baby, usually about ten days to two weeks after the baby's birth. At the time of this call the nurse obtained the following information: Name and address, baby's birth date, whether born in a hospital or at home, and the name of the hospital. She also ascertains whether the baby was discharged from the hospital wholly breast fed, mixed, or artificially fed.

A study of the data showed that 6,665 infants born in hospitals had been contacted; of these 3,736, or 56%, left the hospital wholly breast fed; 1,939, or 29%, mixed, and 991, or 15%, artificially fed. There were 2,650 infants contacted that were born in the home; of these at the time of the call, 2,135, or 83.7%, were still wholly breast fed; 203, or 8%, were mixed, and 212, or 8.3%, were artificially fed. In the different hospitals, the percentages of wholly breast-fed infants at the time of discharge ranged from 30 to 90%.

There were other interesting and rather surprising things shown. Hospitals that were expected to have a high percentage of breast-fed infants were low; some that were expected to be low were high. The high record went to one of the smaller, less known, hospitals handling a majority of mothers of foreign extraction. The hospital next highest was one handling all colored patients. The lowest hospital was one of the best known and whose clientele is from the wealthiest class. The large, exclusively maternity hospitals all fell into the lower 50%; this was also a surprise. One physician casually remarked that the women delivered in his hospital did not want to nurse their babies, so the babies were put on bottle feedings by the staff before they were discharged.

One more word relative to breast feeding in the infant welfare conferences. Conferences attended largely by colored mothers shows a registration of babies over 90% breast fed. These mothers still take breast feeding for granted. Dr. Grulee's organization has a somewhat higher percentage of wholly breast-fed babies than ours; our stations are more outlying and in somewhat better neighborhoods. It seems to follow that the higher class a neighborhood, the fewer the breast-fed babies. This is strikingly illustrated (I think Dr. Blatt and Dr. Parmelee will pardon my mentioning the hospital in which they are especially interested) by the Cook County Hospital; over 80% of the babies born in that institution went home breast fed.

No wonder the more prosperous mother is confused. During her stay in the hospital she has been given no clear-cut idea of what she ought to do or how to do it. She receives all kinds of educational literature; much of it good, such as that sent out by public health and medical organizations, the Children's Bureau, and other child welfare organizations. Then she picks up any one of the popular magazine's especially the women's publications, and what does she see?

From the pages there smiles out at her those superbly beautiful and healthy babies that are the result of various artificial feedings. She wants a baby just like that, right away. She also has noticed that her friends are having a seemingly easy time with their babies on bottle feedings. Then she starts in to convince her physician that she cannot possibly nurse her baby—and too often succeeds. Worse still, she may go ahead and put the baby on a bottle without consulting any one. However, I cannot resist making one encouraging comment at this point; we really are getting away from the complicated formulas of a few years ago and getting back to simplicity in formula preparation. I hope we shall eventually reach the ultimate in simplicty—breast feeding.

I believe that most mothers want to nurse their babies—at least they say they do; but no matter how much a mother may seem to want to nurse her baby, she is usually also sure she cannot; and the physician feels about the same way; he believes in breast feeding but agrees with the mother as to her ability; the result is a complementary formula for the baby who is soon completely off the breast.

I would like briefly to tell you just a little of what we, as a public health organization, are trying to do to create an interest in breast feeding and to get the majority of the infants born in the city back on the breast.

First of all, we believe in breast feeding. We not only believe it is the best way to feed a baby, but believe we can teach mothers how successfully to carry out the procedure. In our attending staff especially we have undertaken to build up this belief and are training them how to teach mothers to keep their babies on the breast. There is one best and accepted method, I think, for providing breast milk and this is where the baby comes in. The baby has to learn to forage, to a certain extent, for himself. With our complementary mixtures we have been making life too easy for him. There is no better stimulation for a mother's breast than a hungry baby. If he is hungry, he will nurse, and if he is getting even a small amount he will keep at it, and if he keeps at it the milk will come. The difficulty has been that we have weakened before the breast attained sufficient productive capacity to support the baby.

We are teaching our nurses the best method of supplementing the baby's efforts in developing and maintaining a breast milk supply. This is by manual expression. There are so many methods that I shall not go into that. Certainly manual expression is best. There is no pump that compares with it in simplicity and effectiveness.

If we, who are responsible, namely, physicians, nurses, and hospitals, present a united front, we shall get these mothers in a frame of mind that they will not only want to nurse their babies but will believe that they can—and will.

The Chairman: In some hospitals the babies are breast fed and in some hospitals they are not, because in some hospitals the nurse has not time to put the bottle in the baby's mouth and in other hospitals she has. If you can get your nurses to agree they must not give the babies a bottle until they are absolutely ordered to do so and not be insisting that the baby be given something to eat because the poor little thing is starved to death, you will not have so many artificially fed babies.

BREAST FEEDING FROM THE STANDPOINT OF PRACTICE

GERALD M. CLINE, M.D.

BLOOMINGTON, ILL.

No doubt the subject of my part of this round table conference will probably remind some of you, as well as myself, of statements made by several general practitioners namely, *"Why don't you practice what you preach."* During the last ten years, on two different occasions, *our medical society has sponsored professional and lay educational groups* in the advantages and technique of breast feeding. I am sorry to say the results of these efforts were discouraging. *The idea is right,* we must admit, and there is a technique, but so often it is easier during the busy hours of the day to prescribe a formula than to spend the time with the mother in an educational program for her, and therefore we do not "practice what we preach."

About the middle of March of this year I had the privilege to spend a few hours scanning over several old books from a library of a famous doctor of medicine who practiced in the days before the Civil War in Alabama. One book of particular interest was "A Practical Treatise in the Management and Diseases of Children," by Drs. Evanson and Maunsell, published in Philadelphia in 1843. These authors wrote quite at length on "The Management and Food after

Birth." The following quotations from this chapter are still very true and practical today:

Very few children in this country are fortunate enough to escape being dosed with castor oil, immediately upon their arrival in the world; and many are obliged to undergo the additional peril of having a quantity of calomel forced down their throats. Neither of these practices, however, is constantly necessary, and the last is positively injurious. We are, however, decidedly of the opinion that it is better and more natural to allow our infant to sleep quietly for five or six hours after birth and not before that period disturb it or irritate its stomach by anything whatsoever. The mother's colostrum is a purgative. Should the mother be able to supply the natural nutriment at the end of eight or ten hours, or even earlier, as is often the case, we think the infant should then be applied to the breast; and it is highly desirable to avoid giving, in the interim, any other food whatsoever. Should the secretion of the milk not be perfectly established for two or three days, Professor Jorg recommends that nothing should be given but a few teaspoons of lukewarm water. Notwithstanding this, however, should it not be practical to have the child suckled within ten or twelve hours after birth we think it advisable to insist immediately upon a nurse being procured. Requirements of a good nursing mother or nurse are even temperament, rest and a diet of wholesome food of easy digestion and water as a drink."

True it is then that breast feeding is an old, old story and today, with our newest methods of artificial feeding, nothing has taken its place completely. In carrying on an educational program for the mothers, certainly the medical profession should be included. Particularly at the doorstep of the general practitioner and the obstetrician, the program should begin. As the pregnant mother presents herself to the physician for examination, certainly the breast feeding story should be told, which should consist of the following paragraph headings:

1. Breast feeding is the natural way.

2. From the standpoint of the baby, it is the safer way.

3. From the standpoint of the mother, it is the easier way.

4. Breast and nipple stimulation. This should begin several weeks previous to her delivery by applying a lubricant to the nipples and rolling them gently between the thumb and fingers to secure pliability. This helps to make the nipples more prominent and, together with the breast pump, is very useful in the treatment of depressed nipples. Breast and nipples should be kept very clean with soap and water. Sterile vaseline or coco butter are satisfactory lubricants. More of the young mothers of today than ten years ago are expecting some service like this from their doctors. It will pay you dividends in bringing others to you.

After birth the burden still remains with her doctor, unless they choose to call in a pediatrician, and certainly not with the nurses or head nurse of the obstetrical department, as is so commonly done in smaller hospitals. You will agree with me that if a nurse should give a hypodermic of some narcotic to the mother without orders she would be severely reprimanded, yet often she is forced by the doctor or by the neglect of the doctor to supervise the after care of the baby who is the most precious and valuable possession these parents will ever have. I dare say the narcotic would probably not harm the mother, but the heavy milk formula taken from a complementary celluloid card or chart, stuffed into a baby's mouth with a long, easy-flowing nipple, will most often ruin any plan for breast feeding and at times cause serious gastric disorders in the newborn. This is especially true if given routinely early. Therefore, upon the hospital care of ten days to two weeks lies the success or failure of breast feeding. The important items of technique here are:

1. Intelligent nursing care of the mother, which includes rest, absence of visitors, cleanliness, together with the prerequisites as quoted from Drs. Evanson and Maunsell, namely: even temperament of mother and a diet of wholesome food and water.

2. Periodic stimulation of the breast by the infant at intervals of from three to four hours. Needless to say, the mother's milk does not secrete for from forty-eight to seventy-two hours after birth. Warm water, or I prefer 5% dextrose solution, should be given after the nursing period every three to four hours until the mother can supply the needed quantity.

Usually after eight hours, after the mother has recovered from the fatigue of labor, I advise applying the baby to the breast for five-minute nursing periods for the first day. By the fourth day the infant is usually nursing fifteen to twenty minutes on the single breast and taking one to two ounces of the 5% dextrose solution after the feeding. As the breast milk increases, the dextrose solution is omitted.

I will pause here to explain why I prefer this routine. First of all, the short nursing periods

at the onset do not tire the mother or child. They also allow the nipples to become accustomed to the trauma of the suckling baby. The dextrose solution is particularly advised because the caloric value is low and the amount does not fill up the baby's stomach with food, causing it to become lazy and satisfied without the effort of nursing. Also I am entirely convinced that many babies, who I feel are allergically inclined, so to speak, if fed cow's milk early are definitely sensitized to the protein of cow's milk during the first few days of life, the results of which are oftentimes the eczemas and asthmas and hay fevers of later life. There is no sensitizing protein in dextrose solution.

The prenatal and postpartum education and care having now been outlined brings us to another important period to be considered in the success of breast feeding; namely, second to fourth week of the baby's life, or the time when the mother returns to the home with her offspring. Here, I believe, even temperament and rest of the mother plays its greatest part. Relatives and neighbors, of course all well meaning, are in my mind the greatest disturbing factor. The mother for the first time realizes her responsibilities and her fears and shortcomings. Outside suggestions and advice are abundant. Rest and fluids for the mother are lacking; milk supply diminishes rapidly and the infant soon registers his wants by his instinctive cry. Hunger is the answer. The baby has his so-called colic evidenced by a painful cry and greenish, curdy stools. Certainly at this period great care is needed; the mother needs her doctor's intelligent support. The same mother returned to the hospital for a few days or put to bed at home with a good nurse in attendance oftentimes at this period will restore what seems to be a hopeless procedure. On a few occasions where I have been a part of the program from the beginning, I advise after the birth a good nurse at the home for two weeks and the student nurses at the hospital. I am sure this will increase the number of successful breast fed babies.

As time goes on, this mother will still need the physician's help. Kind and prompt attention to her questions as well as planned future programs for her to follow make for a larger successful practice, a healthier child and a happier home.

In conclusion, I am willing to admit that these ideas may read well; that, try as you may, there are many cases in which for various reasons as mentioned by other members of this conference these ideas can not be successfully carried out. We will and must be prepared to advise complementary and supplementary feedings for many babies. However, the pendulum has swung too far away from the safe and natural way, and we as physicians are solely responsible for its return.

GENERAL DISCUSSION

Dr. F. E. Inks (Princeton): All four of the discussors, in my opinion, have omitted to emphasize one of the most important points on breast feeding. That is the care of the nipples. If you can get the mother's nipples in condition so they are not sore and she will not be afraid to nurse the baby, it will be much easier. I have found the patients whom I take care of have nipples which are not so sore if instead of having the nurse wash them with a little piece of cotton I insist that each nipple be washed with soap and water, cleansed with clear water and when the baby is nursing that nipple again be washed with soap and water and thoroughly dried. Of course, I do not see as many as most of you, but I do my own obstetrics, and see about 50 a year. I think if the nipples are thoroughly cleansed and if you start nine months before the baby is born to teach the mother how to take care of the nipples and dress and bathe her baby when it does come you eliminate much of this difficulty.

The Chairman: I think that is an important point. What we have laid stress upon is the psychological attitude of the public and the doctor. We have tried to persuade them what the psychological attitude should be. We should not neglect the physical measures which will bring about the effect we want to produce and the care of the nipples is certainly one.

Dr. W. E. Carnahan, Macomb: Not only is the doctor at fault but our teachers are at fault. I recently read a new three volume work on obstetrics in which the very definite statement is made, that prenatal care of the nipples has no influence whatsoever. I would like to see stressed, also, the training of the mother on diet to produce milk in the mother who loses her milk supply.

The Chairman: In the first place, we are not responsible for the obstetrical text-books. I do not think you will find such in books on infant feeding.

Dr. Carnahan: As a specific example, a young mother came to my office yesterday; she had gone home from the hospital on the eleventh day with a good milk supply. This milk supply continued until the baby was approximately eight weeks old. Two weeks ago she noticed that the baby was not doing so well, was crying more, and that its weight had become stationary. From her telephone conversation I was satisfied that the baby was not getting sufficient food. On going into the history yesterday, I could find absolutely nothing to account for her loss of milk supply.

Is there anything I can do to bring back that milk supply eight weeks after the birth of the baby?

The Chairman: Most people do not realize that breast milk is a secretion and therefore subject to the effects which all secretions are subject to, and that the matter of diet is only one of the factors in the situation. We all know that secretions of the stomach and secretions elsewhere are affected by the mental attitude. We all know that a shock will temporarily, sometimes permanently, reduce or even cause a cessation of the flow of breast milk. I do not know of anything that will make breast milk come back when the breast is starting to go. I do think many of these cases are definitely on the basis of a psychological reaction, that if we got right down to the basis of things we will find that something is worrying that mother. If it is not a sudden change but is a slow change then it is probably a matter of inheritance.

I want to say it is not without importance to nurse the baby even if it is only for the newborn period, if we only nurse the baby one month or two months; it is better often than if the mother does not nurse it at all. I know of no diet that will get results. I do know many women cause their breast milk to disappear by dieting, because they think they have to fill themselves up with a lot of milk in order to make breast milk; this may cause gastrointestinal disturbances and their breast milk disappears. There is nothing to be said about the diet of these mothers other than they should have sufficient diet.

I have also had results another way. I do not know why, but in the days before prohibition when a mother did not have a very good breast milk supply, I used to see she got a quart or two quarts of beer a day. I do not know whether it rather steadied her nervous system or whether it had some specific results, but apparently I did get results.

Dr. Arthur H. Parmelee, Oak Park: I am not going to advocate beer, but I do think giving mothers beer is better than stuffing them with milk, chocolate and cocoa.

What I wanted particularly to say was that the most important factor in keeping up the breast milk supply is stimulation. One of my peeves is the practice of letting the baby go through the night without nursing at the breast; this I think is unphysiologic and unfair. I think the baby during the first month should be taken to the mother every four hours throughout the twenty-four hours. They will demand it when they get home and the small amount of extra rest the mother gets in the hospital is of little importance. She is more comfortable if the breasts are emptied at regular intervals.

I would like to mention the practice I have used for a good many years. After the nipples have become accustomed to being nursed upon and there is little danger of their being irritated by too much nursing, I let the baby nurse at both breasts at every feeding. I have done this consistently in every case for at least the last fifteen years and have not reverted to the practice of alternate breast nursing. It is more physiologic. When you stimulate one breast you stimulate the other and start something you do not finish unless both breasts are nursed from. The farmer does not milk on one part of the udder at one time and the other part of the udder the next time, but milks all four each time. The breasts should be stimulated in exactly the same manner, in my opinion.

INJECTION TREATMENT OF HERNIA

W. M. McMILLAN, M. D.
CHICAGO

The object of this method of treatment of hernia is to produce an artificial proliferation of fibrous tissue without suppuration, which will close permanently the defect in the abdominal wall through which the hernia protrudes.

For more than one hundred years attempts have been made to accomplish this object, but unfortunately many of the efforts have been made by men unfamiliar with anatomy and asepsis, and by quacks who employed such foreign bodies as high melting point paraffin to obstruct the aperture. Velpeau of Paris as early as 1835 used irritants with apparent success to cure hernia. Heated instruments have been used to cauterize the surface of the canal in inguinal hernia, in the attempt to obliterate the defect by scarring and subsequent constriction. Extremely irritating solutions have been injected carelessly into the abdominal wall near the hernia, sometimes without the patient's even wearing a truss. Disastrous results have followed, causing the medical profession to look with a jaundiced eye upon any endeavor to treat a hernia by injection, and the public has had good reason to fear the many complications which have occurred, such as peritonitis, fecal fistula, gas gangrene, and even death. To this may be added the statement that many unethical men have sold and are now selling worthless solutions and making extravagant claims for their value, thus further prejudicing the medical profession against this treatment. Although some criticism has been leveled at this treatment because of the claim that it is impossible to blindly inject this area accurately, it has been found that in cases in which methylene blue is injected, and the patient subsequently operated upon, the methylene blue has been deposited quite accurately in the area for which it was intended. Another interesting observation is

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that when the external ring is injected the methylene blue is seen to travel along the lymphatics to the internal ring, thus spreading through the entire area of the inguinal canal.

About three years ago I first became interested in this study, and observing the excellent work of Drs. Bratrud, McKinney of Minneapolis and others, I decided to investigate this method. Following the successful use of the method over a period of a year the opportunity was afforded to make a study of it at Northwestern University Medical School both in the experimental laboratory and clinically. By the use of experimental animals the results were studied following the injection of various irritants at different locations. Several solutions were discarded as producing no reaction or too severe a reaction, and two solutions with the following contents were selected to be used clinically:

Thuja Solution containing Phenol 30 c. c. Grain Alcohol 15—Lloyds specific Tincture of Thuja 15.

I. Tannic Acid solution.

This solution is used in three different strengths. It is a distillate solution prepared by distillation of the tinctures of a group of tannic acid bearing herbs to which the following ingredients are added:

Benzyl Alcohol—3%
Thymol—0.5%

Reagent grade natural tannic acid is then added to make the resultant solutions assay "A" solution—¼% tannic acid, "B" solution—½% tannic acid and "C" solution—1% tannic acid.

These solutions were injected in doses sometimes two to three times that to be used in the human and the injections were made at the following sites; the blood stream—directly into the abdominal cavity—the spermatic cord—the testicle—and the fascia about the inguinal canal. There were no fatal reactions and aside from transient respiratory and blood pressure variations the only reactions noted were tissue changes without necrosis, except those animals in which these solutions were injected into the abdominal cavity revealed on opening 10 days later a discrete area of necrosis with beginning healing. The microscopic changes so far as those occurring in the fascia about the inguinal canal will be described later in detail by Dr. Cunningham, who aided me in this work. I would, however, like to say here that there was no tissue necrosis and there was new fibrous tissue production which went on to form firm permanent tissue with only partial absorption.

No atrophy of the testicle was noted either when the solutions were injected into the spermatic cord or directly into the testicle although here as in the fascia inevitable changes took place as will be described later.

In selecting cases for treatment the following conditions were considered to be contraindications: sliding hernias, incarcerated irreducible hernia, hernias associated with undescended testicles, hernias where the defect was obviously too large, diseases producing ascites, markedly enlarged prostate, chronic severe coughs, hemophilia, syphilis and toxic goiter. I might add that patients who were not relieved of all symptoms by wearing a truss as well as neurotics were not treated by this method. All patients were carefully examined for any sign of atrophy of either testicle before treatment was instituted. It is surprising the number of patients presenting themselves for relief of hernia who have such atrophy, our experience showing about 8%.

Considerable trouble was encountered at first with trusses but generally we found that in selecting a truss the pressure must be applied anteroposteriorly and not circular—a special spring type with a non-skid pad is therefore the type we are using. This truss must hold the hernia reduced at its point of exit at all times, and should be fitted sufficiently firmly to produce an actual depression in the skin without damage thereto. It is at once apparent that with an indirect inguinal hernia the pad must be placed high over the internal ring, and with a direct inguinal hernia it is placed lower over the external ring. Failure to observe these details and application of a proper truss will result in inability to cure the hernia. (I might say that the fitting of trusses now is largely in the hands of drug store clerks.) The truss must be worn day and night for one to two weeks before treatment is started. The purpose of this is to prevent interference with the treatment after it is once instituted due to skin irritation, and most important of all to be sure the hernia is reduced and can be continuously held so. After treatment has been carried on for one to two months the truss may be removed at night after retiring and applied again in the morning before arising. The truss should not be removed permanently

1. A preparation of this type is manufactured under the trade name of Proliferol.

until one is reasonably sure that the hernia is firmly closed, which is usually found to be two to four months from the time of beginning treatment. In the case of large hernias it is necessary to have the patient wear the truss day and night for a longer period. At all times when the truss is being worn it must be removed and replaced with the patient in the supine position.

The patient must be instructed that although he may carry on his normal activities while under treatment, the pad must at all times be in proper position, and if necessary a perineal strap must be worn.

As stated previously the thuja mixture and the tannic acid, alcohol solutions were because of their satisfactory action chosen for our clinical work. Other solutions were not used because they gave no local reaction or too severe a reaction or resulted in a general reaction simulating shock.

Dosage. In the case of thuja solution four to eight drops was the dosage used; and of the tannic acid solution one to four cubic centimeters, depending upon the strength. When the latter solution was employed, a preliminary injection of one cubic centimeter of two per cent. novocaine solution was required. After its injection the needle was left in situ for a few minutes, and the tannic acid solution was then injected. The minimum dose was used in the region of the internal ring and the larger doses along the canal and the external ring. A tuberculin syringe was used for the first solution, and a five-5 c.c. syringe for the latter. A one and one-half to two-inch 22 gauge needle was used, preferably the security anesthesia type to prevent the possible accident of breaking the needle within the abdomen.

Before treating the patient the following general rules must be laid down. One must be certain that the hernia is reduced. The patient must be placed in the supine position and the truss removed and replaced by the surgeon, unassisted by the patient. The skin is prepared by washing with 40% alcohol. The solution is injected slowly and firm pressure applied to the site of the injection for a few minutes thereafter. As the majority of our cases were of the inguinal type the technique for this type of hernia will be given in detail. The internal ring is located slightly above the mid-point on a line drawn between the anterior superior spine and the symphysis. These three points represent the landmarks which are used as a guide in the treatment of this type of hernia. The direction of the needle should be slightly caudal and not directly vertical to the abdomen. All cases should be injected along the entire course of the canal regardless of the type of hernia. One should first inject the area through which the hernia protrudes, and subsequently the remainder of the canal. In addition, some of the solution must be placed in Hesselbach's triangle, depositing the solution along the conjoined tendon and upon the transversalis fascia. In this case the needle is introduced mesial and posterior to the cord. A distinct "give" sensation is experienced as one goes through the fascia. The syringe must be aspirated before the injection is made to be sure the needle is not in a blood vessel. When injecting the solution about the external ring, it is obviously easier accomplished under the direct guidance of the surgeon's finger which is inserted into the ring by invaginating the scrotum. When injecting the internal ring you are at once aware of the fact that the point of your needle is therein because it can be moved freely in any direction. In most cases the patient will complain of a slight sensation of pain along the cord and in the testicle on the side of injection.

In the case of femoral hernia the solution is used in the minimum dosage and the needle must be placed very carefully in the femoral canal medial to the finger which is placed therein, in order to avoid injuring the femoral vessels and nerve.

In incisional hernia the minimum dosage is also employed, and extreme care must be exerted to deposit the solution directly into the fascia without injury to a viscus. The same obtains in the treatment of umbilical hernia.

The number of injections vary according to the type of case, the average being eight to twelve, although sometimes as few as four or five and as many as twenty-four have been necessary. As few as four are not recommended as the tissues should be over-built to allow for absorption. The average case is injected once or twice weekly depending upon the reaction. The patient should not be discharged until the entire area through which the hernia has presented itself is firm and no impulse can be made out

on coughing. The patient is advised, on being finally discharged, to return for a check-up twice yearly, to avoid constipation and to reapply the truss if seized with any unusual and prolonged coughing spells.

As for complications, we have to date not observed any more serious than a temporary swollen, painful condition of the cord, which was relieved by hot or cold applications, and no patient has been entirely incapacitated for more than one or two days. To date, we have not observed a hydrocele of the cord which required aspiration. They have all subsided within a week or ten days without any treatment other than local applications.

Three reactions have to date occurred where the patients complained of some abdominal pain and have exhibited marked weakness; breaking out in a cold sweat and simulating a mild degree of shock. All symptoms disappeared in an hour without treatment except in one case which was removed to a hospital because of the relatively severe symptoms. He made an uneventful recovery and left the hospital a day later without special treatment. This case I am inclined to believe can be explained on an allergic basis. So far as impotency or sterility is concerned, this has not to date been accurately checked, but we have had no complaints or reports of this in any of our cases.

In summarizing my expereince with this method I would say that it covers about 400 cases treated, of which about 200 have been discharged as cured. The recurrent rate is to date 8%. My oldest case from a standpoint of date discharge is three years. There have been eight cases where a closure could not be obtained. The selection of cases was very liberal, excluding only the cases showing definite contraindications. Many of them were surgical recurrences. Contraindications were found in about 10% of the cases examined. The age range was 2 to 90 years.

In conclusion, the author believes that this procedure should be regarded as a surgical one for obvious reasons and if it has merit—as our experience and that of others indicates—it should be placed in the hands of the regular surgical profession where it belongs. To date we can say that this method is as safe or safer than surgery, the incidence of recurrence is less than after surgery and where recurrences do result they are invariably smaller than the original. In addition, the further procedure necessary for a cure is relatively simple as compared with a new operation such as is required after surgical recurrence.

It might be stated that it is too early to be sure of our percentage of recurrences but unfortunately the same can be said of the surgical recurrences as there is a wide difference of opinion regarding it. We do feel that our figure is quite accurate as we have adopted a careful follow-up system and the patients seem very willing and anxious to return for further treatment, which cannot be said of many of the surgical recurrences.

In addition the economic side of this method of handling hernia must not be lost sight of as the hospital expense and loss of income from absence from duty for several weeks is spared these patients.

The future may show the advisability of more careful selection of cases. We feel the field is open for further investigative work carefully controlled on the basis of our present results.

Finally we must not forget that accidents can and will happen if those attempting this procedure are unfamiliar with it or careless in carrying it out.

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DISCUSSION

Dr. D. R. Cunningham, Evanston, Ill.: I am going to deviate somewhat from the regulation rôle of a discussant to Dr. McMillan's very splendid paper, because I was associated with him in a great deal of the work that he has here presented this afternoon.

Dr. McMillan has mentioned that opportunity was afforded us to make a study of the results of injecting irritants into the tissues of dogs. I would like, at this time, to show a few lantern slides of microphotographs of tissues to demonstrate exactly what does take place after sclerosing irritants are introduced into the inguinal canals of dogs. 1. The first lantern slide shows proliferating fibroblasts and remnants of lymphocytic infiltra-

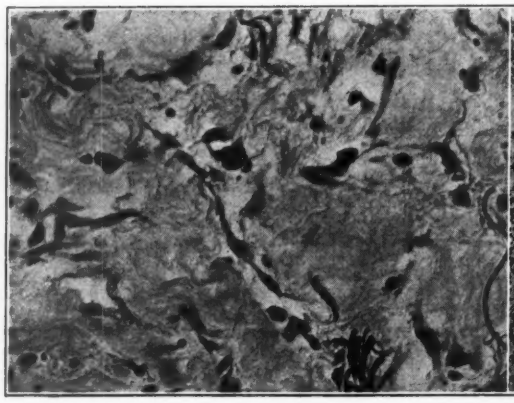

Fig. 1. Showing proliferating fibroblasts and remnants of lymphocytic infiltration one week after injection.

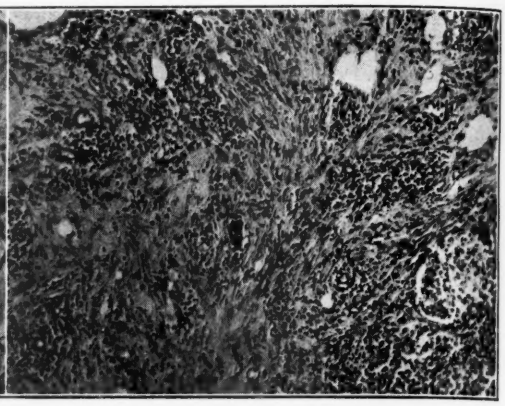

Fig. 2. Showing granulating tissue and maturing fibrous scar two weeks after injection.

tion, in a section of tissue removed from the inguinal canal of a dog, one week after the latter was injected with thuja mixture. 2. The second slide shows granulation tissue and maturing fibrous scar two weeks later from the same area as slide number one. 3. The next slide shows evidence of maturing fibrocytes and remnants of lymphocytic infiltration, and the last slide shows 4. mature connective tissue together with old scarring in a section of tissue eight weeks after the first injection was made. My purpose in showing these slides is merely to demonstrate that the theory of initiating new firm fibrous tissue in the inguinal canal to obliterate a defect is not without foundation. However, I am of the opinion that the biggest disappointment that will befall the operator who uses this method is this; after the entire inguinal canal has been injected in the course of several treatments and no impulse can be found either at the external ring or at any place along the canal, the surgeon will, after the lapse of some weeks, note that a good bit of his newly formed fibrous tissue has been absorbed and that the hernia has recurred. In other words, how can this scar tissue be made permanent? I do not attribute much worth to the claims of surgeons using this method or to the manufacturers of certain solutions for this purpose, that one solution has superior qualities over another in the production of fibrous tissue. When a reaction occurs from whatever solution is used the same final result is lymphocytic infiltration, new fibroblasts, and finally mature connective tissue. Dr. McMillan has mentioned the necessity of a properly fitted truss. It is quite surprising to see a patient come to the office wearing a truss, which is absolutely useless to him. The mere fact that some pressure is exerted at some place along the inguinal canal, very likely explains why some of these patients feel fairly well even when wearing an ill-fitted truss. When the truss is applied properly and has proven to retain the hernia, in any position the patient may assume, all symptoms of discomfort and "heaviness" and "drawing" in the inguinal area are promptly relieved. Dr. McMillan has mentioned that one must be sure that the hernia is reduced. Very often small hernias are not detected and the contents could, more often than not, be injected if not recognized as unreduced. I am of the opinion that the cases cited by Dr. Richard Goldhahn must have been complicated by abdominal viscera in the sac. Goldhahn reported three cases coming under his own observation, consisting of two cases of fecal abscess and fistulae and one case of gas bacillus sepsis, and cited two others of much the same complications. I mention this because Dr. McMillan's paper may leave the impression that this technic is quite simple. I think that any needle one and one-half inches long placed in the inguinal canal, first assuming that the needle *is* there, and then introducing phenol or tannic acid or some other irritant entails some amount of risk. I think the method is safe enough in the hands of men who have access to a large number of cases for treatment and enjoy a good deal of experience.

When the methods become more popular, as it is doing constantly, a great many accidents are bound to happen. Whether or not the method will live as a result of what will inevitably take place by the inexperienced operator in the future, is a matter of speculation. We do know that the number of recurrences in the surgical management of hernia has dampened the enthusiasm of the public, somewhat, in this respect. Surgical intervention today for all types of hernia, is not entirely satisfactory. While the Bassini operation or some modification thereof, may give a fine record of successes in the hands of good surgeons, nevertheless, there still remains that group to which the same operation becomes a repetition. In many cases patients are operated upon on the basis of symptoms only, or because the examiner has found an "impulse" with his finger in the external ring. Many of these patients have a slight bulging suggestive of a direct hernia, where there is no indication for surgery. On the contrary, there are many patients who complain of a certain amount of discomfort in the area of the internal rings, on one or both sides. These patients have distention and gastrointestinal symptoms and are often diagnosed as colitis, etc. In many of these patients, one cannot

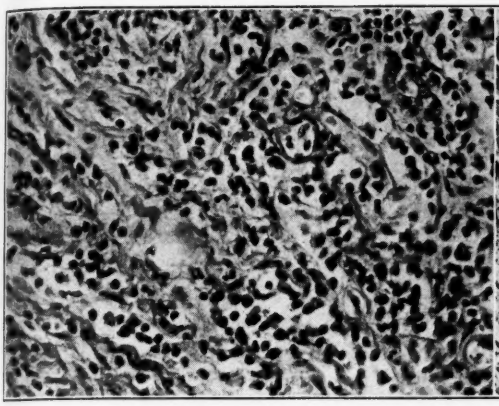

Fig. 3. Showing maturing fibrocytes and remnants of lymphocytic infiltration.

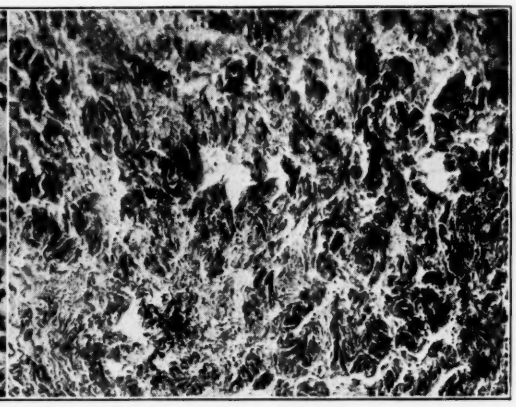

Fig. 4. Showing mature connective tissue together with old scarring eight weeks after first injection.

definitely diagnose an indirect hernia because the neck of the sac is kept fairly well closed by the muscles at that point but as a weakness develops, inflammatory changes occur about the neck of the sac as it tries to progress forward and the resulting symptoms, referred to the peritoneum, occur. I believe in these cases the injection treatment with some support at the ring is ideal treatment. Personally I do not think we are justified in operating on a patient where we cannot definitely convince ourselves that a hernia exists.

The late William B. Coley reporting on 100 cases treated by injection, gave us the sad story of 100% recurrence. However, these figures differ widely from those reported by others who are using the injection method. I think it is quite interesting to think about the work of Dr. McBurney, some forty years ago, who after widely incising the external aponeurosis, and removing the sac high beyond the internal ring, packed the open wound with iodoform gauze to induce scarring of the whole area. It was soon noticed that what was firm connective tissue at one time, gradually became thinner and recurrences resulted. Much the same type of scarring is anticipated with the injection method except, unlike McBurney, the fascial planes are not disturbed. I think it is well that we present the method open-mindedly, in view of the doubts of efficacy of the method, we have entertained in the past. Dr. McMillan has presented a resumé of the treatment in a purely investigative manner, and leaves us to judge for ourselves, as to its usefulness. If the method is not satisfactory, it will not be long before it becomes discarded, and if it has merit it will be kept and used by those who can satisfy themselves with its results.

Dr. George deTarnowsky, Chicago: It is interesting to go back fifty or seventy-five years to the injection treatment of hernia. I feel that as a surgeon Dr. McMillan's paper rather justified our results. When we speak of failures in herniotomy we include not only the oblique, but the direct and the ventral hernia. McMillan's method has very limited application. He mentioned the minor complications, but he forgot to mention direct hernia. Any large hernia is not suitable for injection treatment. The sliding hernia is not suitable. It is quite true that Dr. McMillan and his associates have taken up this study scientifically by experiments on dogs before trying it on the human being. It is true that we have a great number of sclerosing agents, and it is true that scar tissue will thin out. Dr. McMillan obtained his best results in the small, oblique hernias, but those are the hernias in which we get 100% good results with surgery.

He spoke of the economic saving. The patients have to come back for check-up of these hernias repeatedly. When you analyze your entire treatment from an economic viewpoint, I do not think there is much to be gained over the knife of surgery.

I would question its use in femoral hernia. There is not much in femoral hernia except the sac, only in rare cases where it passes above Poupart's ligament and makes the surgeon think he is dealing with a direct hernia.

I think the word of warning that the first discussor brought out is worth repeating. If any of you are going to attempt the injection treatment, try it out very carefully on the cadaver. Get the anatomic points carefully outlined, and then watch for the complications. If this becomes popularized, that is, taken up by the casual operator, I fear we will have as many calamities as we read about fifty or sixty years ago.

Dr. C. E. Ward, Cleveland, Ohio: It has been a great pleasure to know Dr. McMillan and to have had the opportunity of attending his clinic at Northwestern University and I have been very much impressed with the results he has had with the injection treatment of hernia.

During the past thirty-six years I have operated on several hundred hernias and my results have been about the run of the mine, the average number of cures and recurrences. I did not accept the injection treatment of hernia overnight but made a thorough study of it over a period of several years before adopting this method of treatment. I believe it offers a tremendous

field for any man who will study his anatomy minutely. Personally, I went back to my cadavar work and injected methylene blue into the inguinal canal and observed where it flowed. This gave me definite knowledge of the channel the fluid follows when injected into a patient.

No one should attempt to inject a hernia unless he is definitely sure that it is completely reduced and can be held reduced by a truss. After you are satisfied on this point the most important step then is to be able to differentiate the types of hernia. We all should be able to do this but, unfortunately, we all cannot. Mistaken diagnosis as to the type of hernia has caused much of the failure and criticism of this method of treatment.

It is most essential that you know how to reduce a hernia and to know when a truss is well fitted. Dr. McMillan has mentioned the importance of the truss and I thoroughly agree that while it is not within the province of our profession to fit the truss, we should know when it is well fitted and should have one truss man upon whom we can rely. When I send a patient to a truss maker, I send the diagnosis and tell him how the truss is to be fitted. If you will watch your truss, you will eliminate a great deal of trouble.

Concerning contraindications, I think Dr. McMillan has been overly cautious. I believe that none of us would attempt to operate on a hernia on a man seventy-six years of age with a large simple hernia, complicated with either nephritis or diabetes or an enlarged prostate and one in whom the hernia rolls out every time he attempts to void but I can take that same patient into my office and, if I can reduce his hernia and hold it reduced with a truss, I feel absolutely confident that I can give him more relief by injections than I would by surgical procedure, and this without danger to his life. When we meet with an elderly gentleman with a hernia which a truss will not hold, we can put him to bed for four or five days, give him three or four injections which will create a sufficient amount of exudate and fibroblasts so that his truss will hold the hernia reduced and then continue treatments as an ambulant case.

I was surprised to hear Dr. McMillan say that he had had one gentleman 90 years old. My eldest patient is 76 years of age and my youngest one year. I find that about 95% of the cases which I have seen are male patients and 5% females. They are subdivided into four groups, direct, indirect, femoral and post-operative hernias. Of 100 hernias, you will find 10 recurrences, post-operative patients coming for relief who have been operated on as many as three times. Many have had fascial transplants.

Twenty per cent. of the hernias are direct, that is my average. Some statistics show it to be lower. Bilaterals will run about ten per cent. Right hernias occur twice as often as left hernias.

The Industrial Commission of Ohio at the present time recognizes my work and allows me to treat patients by the injection method. I do not know whether or not your Illinois Commission recognizes it.

As to the preparation used. I feel that we will, in all probability, have a better preparation than either tannic acid or thuja mixture. I firmly believe that no one mixture will cure all types of hernias.

I treat my cases individually and sometimes use a combination of thuja and tannic acid. My practice is a referred one and has to be carefully handled, and to minimize the discomfort, I have worked out what I call a "Triple A" anesthesia. I first apply to the skin where I am to make my injection a few drops of a solution of a 10% benzocain dissolved in one dram of alcohol to which is added one dram of a 5% carbolized oil and one dram of castor oil. The castor oil is used to hold the solution in the spot where you are to make your injection.

This solution acts as a local anesthetic to the skin and undeniably lessons the pain when the needle is inserted. The second anesthetic is a solution of novocain and diothane. The diothane is similar to novocain but more prolonged in action, lasting, as a rule, for several days. I use 2 cc novocain with ½ cc diothane. I use first a very fine needle and make a small wheel into the subcutaneous tissue, then use a 1½ inch, 22 gauge needle and inject the remainder of the novocain mixture into the canal, leaving the needle in situ. About five minutes later I slowly inject the sclerosing fluid through this same needle into the inguinal canal. When you feel the needle pierce through the fascia you will know you are in the canal. For my convenience and to avoid any confusion between the two solutions, I use a blue syringe for the novocain and a white one for the sclerosing fluid. I find it essential to keep a record of each injection on a card which I have had printed for this purpose.

Under complications, Dr. McMillan has said that he has never had a hydrocele of the cord following injections. I have had three following direct hernias. From a surgical standpoint direct hernias are difficult to operate on and the results are not as satisfactory as the other types and more frequently recur. Direct hernias are also more difficult to treat by the injection method and recurrences are more frequent.

In injecting the fluid in to Hesselbach's triangle, one may get a few drops of the fluid into the upper or lower angle of the cord and in this event a hydrocele might result and if it does, aspiration may be necessary. One patient showed an allergy to tannic acid. He had bilateral hernia and I treated both sides at the same time and I feel sure that I gave him too large a dosage. The ill effects passed away in about three hours, however. I have also seen swelling of the testicles as the result of a treatment. A suspensory was applied and they were made comfortable and the swelling quickly subsided.

One point I want to bring out especially; I have not seen an infection or a necrosis. If you know where your needle is, certainly this treatment is just as safe as any surgical procedure that has generally been adopted.

Dr. John A. Wolfer, Chicago: I want to take this opportunity, as this work comes from my school, to express the policy in our division. Three years ago at a meeting of the American Surgical Association in Toronto, Dr. Wangensteen, Professor of Surgery at

the University of Minnesota, told me that if he had a hernia he would have it injected and not operated upon. Knowing him as I do, I thought there must be something to it. It is the duty of a University to find out whether a suggested procedure has real merit. There is no other way we can teach or advocate for or against a procedure unless it is carefully investigated, therefore, Dr. McMillan started to work out this plan. They understood the situation perfectly well and went into this with an open mind. They are going to study their cases carefully. The basic principles have been studied in experimental animals. I want to express this as the policy of our Department of Surgery. The reason for the frequent visits was for the purpose of observation and does not mean that the patient who has received the injection method of treatment need to return so frequently.

Dr. W. M. McMillan, Chicago (closing): I have nothing further to say except to clear up one point. We did not eliminate direct hernias in our series. We do not consider them contraindications, though I know they are more difficult to treat and cure. Our recurrence rate includes direct hernia.

HISTOLOGIC CHANGES IN THE TISSUES OF MAN AND ANIMALS FOLLOWING THE INJECTION OF IRRITATING SOLUTIONS INTENDED FOR THE CURE OF HERNIA

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Recent clinical revival of the injection treatment of hernia has led to a desire for sound and careful reappraisal of a method which was a common procedure in the decades preceding and following the Civil War. Perhaps largely because of abuse and exploitation by irregular practitioners then and since and the dramatic progress in the surgical treatment of hernia about 1880, the method was all but forgotten or strongly condemned by the profession. There has been only the barest mention of the injection treatment in the literature in the past 50 years.

Few tissue studies dealing with the effects of irritating solutions, intended for the cure of hernia, have been made. No such studies on the human have been recorded in the past half century. In 1883 Warren reported a brief study of tissue reactions following injection of a solution containing quercus alba. He described the formation of "plasto-lymph" in the first few days. Later this became organized into adherent fibrous tissue. He observed that the fibrous tissue did not acquire much strength until 10 or 12 days had elapsed and therefore he confined his patients to bed for such a period, after which he allowed them to be up and about with a truss. One injection was relied upon to cure the hernia usually. Occasionally a second or third injection was given. Warren seemed to realize that the irritating solution actually caused the development of an inflammatory reaction which was largely proliferative. Apparently Warren made no histologic sections. He has stated that "the essential element of success in the cure of hernia, is the closure of the hernial rings and the inguinal canal." The tissues to be organized into fibrous tissues were "the tendon and fascia which form the internal and external abdominal rings, and the inguinal canal."

Heaton examined the body of a man who had been treated for hernia by injection five years before death. The structures appeared normal. The fibrous tissue at the site of injection seemed to be as tough and resistant as that on the normal side. He suggested that the fibrous tissue, formed by the irritant, contracted around the internal ring and sac and thereby cured the hernia.

More recently Bratrud has shown that fibrous tissue develops after the injection of irritating solutions into the rectus muscle of dogs.

TISSUE REACTION TO IRRITATING SUBSTANCES

The tissue reactions induced by injection of irritants follow the well known laws of inflammation and pass through three separate phases. Bell has designated such phases as alterative, exudative and the reaction of connective tissue cells. Any one phase may overshadow the other quantitatively but each one is present in some degree in all except very mild inflammations. Certain substances may cause one phase of the process to predominate over the others. Virulent bacteria may stimulate the alterative or exudative phase predominantly whereas organic substances such as carbon or carmine particles induce mainly the connective tissue phase. Polyblasts soon predominate in the cellular exudate after particulate organic matter, such as carbon, is injected. Polyblasts may become fibroblasts and may develop connective tissue fibers.

Examples of the permanence and contractility

From the Hernia Clinic, Minneapolis General Hospital, and the Department of Surgery, of the University of Minnesota.

of newly formed fibrous tissue are found following chronic mastitis or esophagitis, in which the stenosis may be extreme; peptic ulcer with hour glass constriction; cicatrization of intestinal ulcers, and the strong inelastic scar occurring in the skin following second and third degree burns.

*Method of Investigation.** Opportunity came to us to observe the effects of irritating solutions in the tissues of man at varying intervals following injection. Such solutions were injected under the fascia of the external oblique muscle in the inguinal region. Patients were selected who, after one or two injections, had decided that they preferred to be operated upon. In some instances the operation was delayed in order to vary the interval between the injection and the biopsy. Specimens were obtained from 25 patients. Where two separate injections had been made at different times tissue was removed from each area. Spinal anesthesia was used in this series. The standard hernioplasty technic was employed. The gross appearance of the tissues at the site of the injection was observed. The cord was dissected free from the inguinal canal and the tissues were examined for evidence of inflammation.

Histologic changes which occurred as the tissue reaction progressed will be described in the following paragraphs.

Very few technical difficulties were encountered because of adhesions formed by the injection. The dissection of the fascial planes was impeded somewhat where the adhesions were extensive.

Histologic Reactions. Human tissue reactions were similar to those which were observed subsequently in the dog and hence only the changes in the human will be described in detail. Tissue changes in the dog will be dealt with in less detail in a subsequent paragraph.

Fifteen hours after the injection of a solution containing phenol, alcohol and thuja* (Fig. 1) the tissues were edematous. An odor of Thuja could be detected. Some pallor but no definite necrosis was visible. Microscopic examination revealed that the tissues were infiltrated with cells about equally divided in number between polymorphonuclears and lymphocytes. The lymphocytic infiltration was more abundant adjacent to the vessels. Some areas of hemorrhage could be seen. There appeared to be a very definite proliferation of the fixed connective tissue cells between some of the muscle bundles. The muscle bundles adjacent to the areas of greatest inflammation showed some loss of striations, indicating early evidence of cellular necrosis.

Five days after the injection of the Thuja solution (Fig. 2) many of the polymorphonuclear leucocytes had disappeared. The lymphocytes remained. Polyblasts and fibroblasts could be seen.

Fig. 1. Photomicrograph (x410) of human tissue 15 hours after injection of thuja solution. An exudative reaction with polymorphonuclear cells, round cells and fixed connective tissue cells. Compare with Figure 7 in which fibroblasts are more abundant and polymorphonuclear cells are less evident.

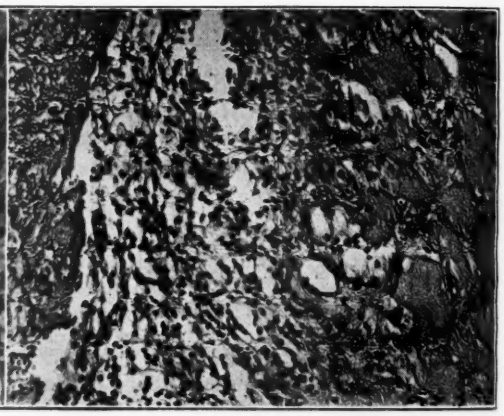

Fig. 2. Photomicrograph (x200) of human tissue. Five days following injection of thuja solution. Muscle fibers show evidence of necrosis, newly formed blood vessels, round cells and a few fibroblasts are seen. Polymorphonuclear cells are present.

*This work was performed in May, 1934.

*Phenol 50, alcohol 25, oil of Thuja 25. Hereinafttr referred to as Thuja solution.

An occasional eosinophile cell could be identified.

A few plasma cells and mitotic figures also could be demonstrated. Here and there a newly formed blood vessel could be seen among the fibroblasts. There was an occasional large multinucleated cell indicating regeneration of muscle fibers. Occasionally such a multinucleated cell appeared as a giant cell. Some of the areas seemed to have advanced further than others in development of fibroblasts but polyblasts and very young fibroblasts dominated the cellular picture.

On the 7th day (Fig. 3) fibroblasts predominated the microscopic structure. Such cells were more abundant and appeared slightly more mature than the fibroblasts which were observed after five days. Collagenous fibers were more abundant. Areas of regenerating nuclei could be seen. Polymorphonuclear cells were definitely decreased in number. Plasma cells and eosinophiles could be seen occasionally. An area of necrotic tissue was visible in a few places.

Eight days following injection the fibroblasts were beginning to appear more mature and likewise more abundant. Intracellular fibers were beginning to make their appearance. Newly formed blood vessels were less in evidence. An occasional polyblast could be seen. The histologic picture was quite similar to that which was observed on the seventh day except that the cellular reaction was more abundant. A few areas of round cells were found.

In one slide eleven days after injection the reaction did not appear to have progressed as far as on the eighth day. A few lymphocytes and polyblasts could be found here and there. An occasional area of necrotic cellular debris infiltrated with polymorphonuclear cells could be seen. A few large scattered plasma cells were identified. Polyblasts and collagenous fibers were less abundant. A few polymorphonuclear cells and lymphocytes were present.

On the fourteenth day (Fig. 4) the fibrous tissue was found to lie in dense bundles. The fibroblasts seemed to have matured. Their nuclei were smaller and the fibers were more abundant. In other areas fibroblast nuclei predominated with only a few fibers between them. There were also areas of lymphocytes. No polymorphonuclear cells could be found. The tissues appeared more dense than in earlier sections. An occasional eosinophile cell could be seen. Small areas of necrotic tissue were visible.

Eighteen days after injection most of the tissue appeared as adult fibrous tissues. A few areas of lymphocytes were seen but were much less in evidence than in earlier sections. In some areas the fibrous tissue bundles were very compact whereas in other areas they were more widely separated.

At twenty-two days (Fig. 5) the structure was similar to that on the eighteenth day.

After forty-two days (Fig. 6) the fibrous tissue appeared as adult fibrous tissue. The fibro-

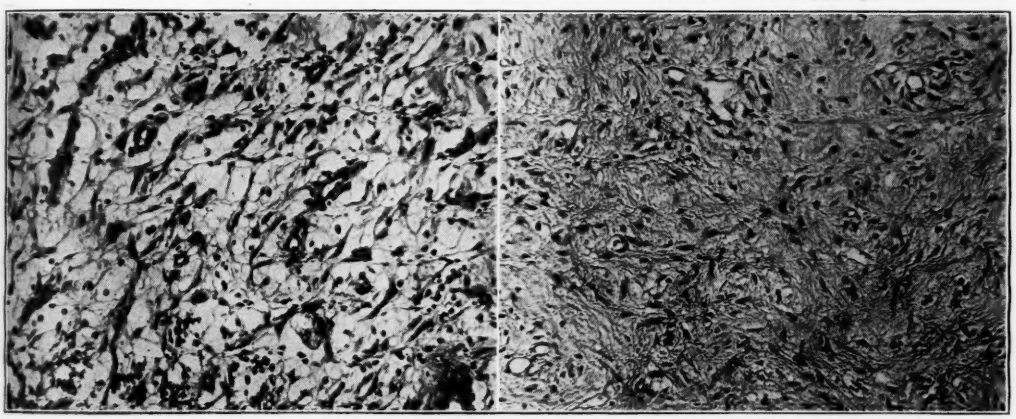

Fig. 3. Photomicrograph (x200) of human tissue 7 days after injection of 4 minims of thuja solution. Young fibroblasts, newly formed blood vessels and some round cells are outstanding features. An occasional plasma cell, eosinophile and polymorphonuclear cell can be seen.

Fig. 4. Photomicrograph (x200) of human tissue, fourteen days after injection of 8 minims of thuja solution. Young fibrous tissue and intercellular fibers are quite evident. An occasional round cell still is present. No polymorphonuclears are found.

blastic nuclei were less abundant and fibers were found in large bundles. No leucocytic infiltration could be found. The fibers appeared to have advanced further in some areas than in others.

No sections were obtained beyond forty-two days.

It appeared from these histologic sections that a solution as caustic as phenol, alcohol and thuja, although it produced fibrosis, also produced an exudative reaction which seemed unnecessary and undesirable. From four to eight minims were used. The section after eight minims showed more areas of necrosis than those sections in which only four minims had been used.

Some patients developed mild systemic reactions somewhat similar to an acute rhinitis or a general reaction with muscle aching and soreness. These systemic reactions occurred after the injection of the mixtures which contain tannic acid. Such reactions continued for 24 or 36 hours. In addition many patients complained of pain in the inguinal region on the second or third day following the injection. This was not an unbearable feature but rather undesirable.

We decided therefore to investigate the action of other solutions in an endeavor to find an ideal solution. We have designated an ideal solution as one which 1. produces no pain when injected, 2. is non-injurious to the tissues, 3. produces no systemic reaction from its absorption, 4. is non-toxic if inadvertently injected intravenously, 5. produces no serious peritoneal reactions if likewise injected into the peritoneal cavity and 6. produces a predominance of the proliferative phase of the inflammation with a minimum of the exudative phase, thereby stimulating the production of fibroblasts so that the defect can be filled with scar tissue.

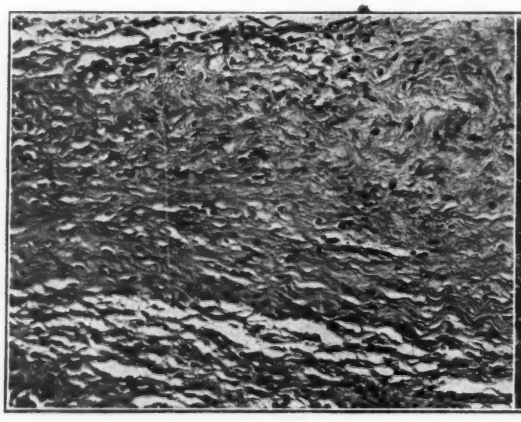

Fig. 5. Photomicrograph (x200) of human tissue 22 days after injection of 4 minims of thuja solution. The fibrous tissue is well developed. Wavy fibers are seen in abundance.

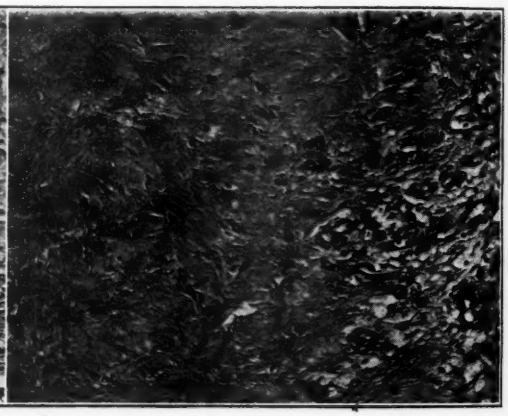

Fig. 6. Photomicrograph (x200) of human tissue 42 days after injection of 4 minims of thuja solution. Fibrous tissue is abundant. To the right can be seen a less advanced stage proliferation.

EXPERIMENTAL INVESTIGATIONS

All solutions which were tried clinically were found effective in producing the desired end result. Certain ones seemed, however, not to meet all of the requirements because of their side effects. Other solutions were then injected into the rectus muscle of the dog in an effort to determine the relative amounts of exudative and proliferative reactions.

Solutions containing tannic acid and alcohol as the principal ingredients were found to produce a greater amount of the exudative reaction than sodium psylliate,* a mild soap, solution. The proliferative reaction produced by sodium psylliate was the outstanding tissue change, the exudative reaction minimal.

Twenty-four hours after the injection of 5 c.c. of sodium psylliate into the rectus muscle of the dog there was no evidence of tissue necrosis and no pallor. (Fig. 7.) Microscopic sections revealed an infiltration of round cells and a few polymorphonuclear cells. There was definite proliferation of the fixed connective tissue cells and young fibroblasts. The muscle cells had not lost their striations.

*Sylnasol-Searle.

Seven days after the injection of sodium psylliate the section revealed numerous young fibroblasts and a moderate amount of fibers. There were no polymorphonuclear cells and only a few round cells remained. An occasional plasma cell and eosinophile cell could be seen.

Subsequent sections revealed a progression of this proliferative reaction so that at the end of twenty-four days the fibrous tissue appeared strong and fully developed. (Figs. 8-11.)

Sections from the human, following the injection of sodium psylliate, have been obtained on the third, fifth and twenty-first day and show a similar reaction to that which was observed in the dog.

The solutions containing tannic acid and about 80% alcohol, when injected intravenously in 5 c.c. doses and thuja solution in six minim doses caused the dog to appear sick and stagger about on the floor for a few minutes. The recovery however was complete. The intravenous injection of sodium psylliate* solution in 5 and 8 c.c. doses produced no demonstrable change in the dog's reaction.

Intraperitoneal injection of the solutions containing tannic acid and alcohol produced, in the dog, what appeared to be pain. He recovered from this within 20 minutes. Twenty-four hours later the peritoneal cavity was opened and it was found that the vessels were congested. There was a slight amount of free fluid but no fibrinous exudate. A similar injection of the sodium psylliate likewise appeared to produce pain which lasted for only a few minutes. Twenty-four hours later the peritoneal cavity was opened but no evidence of inflammation could be detected.

CASE REPORTS

The gross appearance of the tissues in one patient who had received treatments without having been completely cured is reported in the following case history.

Mr. Wm. B. No. 19453A, aged 46 years, had a large bilateral hernia. It had been present for 35 years on the right side and 3 years on the left side. A truss had not maintained reduction satisfactorily. The external rings were estimated to measure 3 cm. in diameter. A new Hood truss was applied and found to be adequate. Twenty-nine treatments were given. After eight months had elapsed the hernia could not be forced into the scrotum but protruded from the external ring about three to four centimeters. The external ring had been reduced to approximately 2 cm. in diameter but we seemed incapable of promoting a complete cure. It was therefore decided that he should be operated upon. A Gallic fascial transplant operation was performed on both sides.

The operative findings revealed that the fascia of the external oblique muscle was thicker than normal. Dense scar tissue was found on its under surface adherent to the cord and surrounding tissues. This fascia could not be dissected as easily from the cord and surrounding structures as is usually the case in an uncomplicated hernia. The usual loose aerolar tissue in the inguinal canal and surrounding the cord was replaced by dense scar tissue. The appearance was much similar to that which is observed in a second operation for hernia. The scar tissue overlying the internal ring was dense but the posterior surface of the internal ring was patulous.

Fig. 7. Photomicrograph (x410) of tissue from a dog 24 hours following the injection of 5 cubic centimeters of sodium psylliate into the rectus muscle. Reaction of connective tissue cells—Fibroblasts, plasma cells and round cells predominate. An occasional polymorphonuclear cell can be seen.

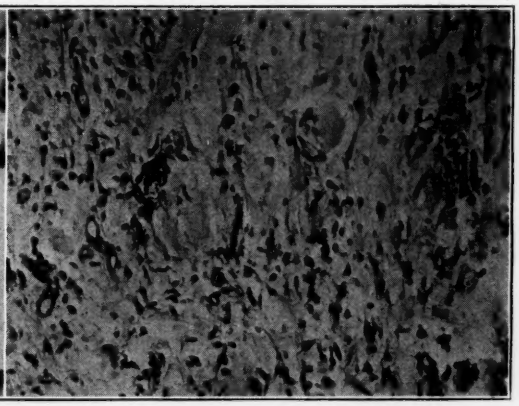

Fig. 8. Photomicrograph (x200) of tissue in dog seven days following injection of 5 cubic centimeters of sodium psylliate into the rectus muscle. Fibroblasts with collagenous fibers and newly formed blood vessels are seen. No polymorphonuclear cells could be found. Compare with Fig. 3 in which polymorphonuclear cells were found.

This apparently accounted for the failure to close the hernia, for in this case the posterior surface had not been injected and was free to give way to the protrusion of the abdominal contents. This taught us the importance of closing the internal ring by circumferential injections so that when the scar tissue does contract it will do so from all sides much in the manner of an annular stricture of the esophagus or rectum, as has been described by Rice and Larson in a paper dealing with the technique.

Induration of the Cord. Induration of the cord is a condition which has been observed on a number of occasions following the injection of the more irritating solutions. This condition manifests itself clinically by the presence of a hard sausage-like swelling extending from the internal abdominal ring to the point in the spermatic cord at which the hernial sac ended. In several patients a clear yellowish exudate was aspirated from the indurated mass. Spontaneous absorption or organization of the exudate took place in other patients. This condition has not been observed as frequently following the use of sodium psylliate as was observed from the use of the tannic acid-alcohol solutions. The following case is an instance of spontaneous organization of this exudate.

Mr. O. S. No. 10869, aged 63 years, had a large right indirect inguinal hernia. He had received six injections at weekly intervals. After the sixth injection he developed an induration of the cord which was subsiding gradually. He decided to be operated upon and this was done three weeks after the last injection. Exploration showed recently formed fibrous tissue in the inguinal canal. The cord was adherent to the overlying fascia of the external oblique. The usual loose areolar tissue in the inguinal canal was replaced by scar tissue. It could not be dissected freely. Sharp dissection was necessary to separate the fascial planes and the spermatic cord. The cord and testicle were removed and the hernial defect was repaired. Examination of the excised tissues showed the cord to be enlarged two and one half times normal diameter. There was considerable edema within the cord. The testicle appeared normal. The walls of the hernial sac were found plastered together, loosely, by soft adhesions. Microscopic section showed areas of newly formed fibrous tissue within the lumen of the sac. (Fig. 12.) The veins were distended with blood but no thrombosis was seen. The vas appeared to be patent in all sections examined. There was no evidence of inflammation around the vas. Sections of the epididymis and testicle revealed no evidence of abnormality.

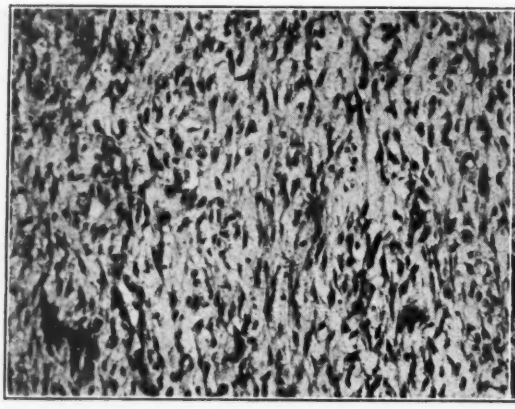

Fig. 9. Photomicrograph (x200) of tissue from a dog 11 days after the injection of 5 cubic centimeters of sodium psylliate into the rectus muscle. Fibroblasts seen in abundance. A few round cells but no polymorphonuclear cells could be found.

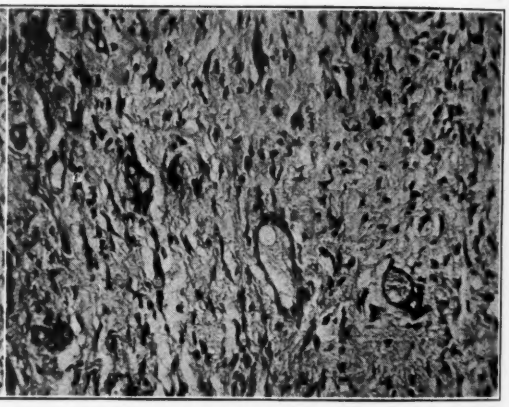

Fig. 10. Photomicrograph (x200) of tissue from a dog 14 days following the injection of 5 cubic centimeters of sodium psylliate into the rectus muscle. Fibrous tissue more mature than in previous section.

The findings in this case seem to indicate that the injection of the irritating solution close to or into the hernial sac will cause an obliteration of the sac by fibrous adhesions and that induration of the cord, as observed clinically, is a manifestation of this type of reaction.

It has not been definitely determined whether or not this fibrous closure of the sac occurs in every case in which the injection treatment has caused a cure. In one instance in which the patient had been pronounced cured by this method a subsequent examination of the region of the internal ring through a McBurney incision failed to reveal any evidence of a hernial sac projecting into the inguinal canal. This case

had not developed an induration of the cord but the sac appeared, nevertheless, to have been obliterated leaving only a small pin point opening at the internal ring into which a probe could be inserted for a distance of about one centimeter. Other opportunities to observe more cases under similar circumstances may eventually give us valuable information in this regard.

In the past three years approximately 800 patients with hernia have been cared for at the Minneapolis General Hospital. The results have been gratifying and the complications minimal. These details are discussed by Rice and Larson in a paper dealing with the end results following the injection treatment of hernia.

Summary. Gross and microscopic findings in the tissues of man following the injection of an irritating solution intended for the cure of hernia are described. Sections were taken from twenty-five patients. At the end of 15 hours the reaction was mostly exudative. Polymorphonuclear and round cells were found in the exudate. Proliferations of the fixed connective tissue cells appeared on the first day. By the fifth day most of the polymorphonuclear cells had disappeared. Fibroblasts appeared on the third day. Fibrous tissue was found in dense bundles after fourteen days. At the end of the forty-second day fibrous tissue was very dense.

The injection of various solutions into the rectus muscle of the dog and a comparative analysis of their exudative and proliferative reaction suggests that a mild soap solution* produced less of the undesirable exudate reaction and no less of the proliferative reaction.

The operative and microscopic findings in a case complicated by so-called induration of the cord are reported and seem to indicate that this sequella, though undesirable, is of no serious concern.

The inability to cure a patient has been explained on the basis that the fibrous tissue was not produced circumferentially around the internal ring.

CONCLUSIONS

Fibrous tissue is produced, in the human, following the injection of irritating solutions intended for the cure of hernia. Such changes are characteristic of an inflammatory reaction in which the production of the connective tissue predominates. Solutions which produce less of the exudative reaction seem scientifically more rational. Clinical trial has proven the method to be effective in carefully selected cases and the histologic investigations, as reported in this paper, seem to establish a scientific rationale for the method.

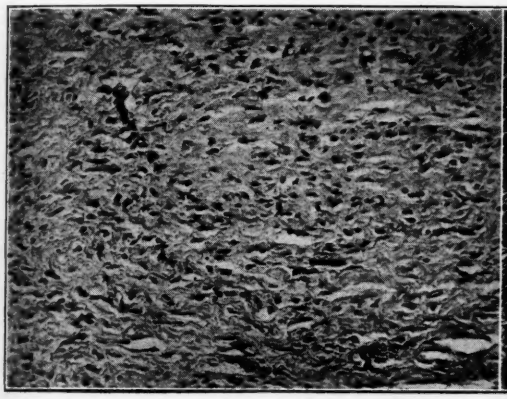

Fig. 11. Photomicrograph (x200) of tissue from a dog 23 days after the injection of 5 cubic centimeters of sodium psylliate into the rectus muscle. Fibrous tissue beginning to assume wavy characteristics.

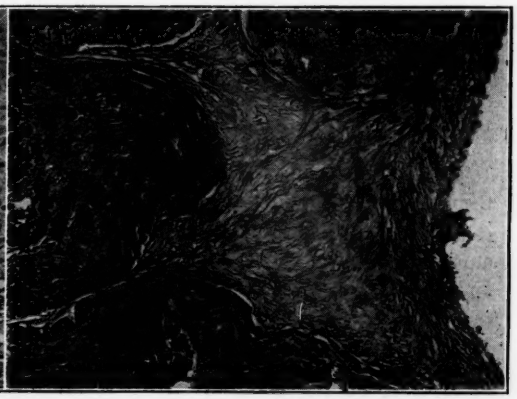

Fig. 12. Photomicrograph (x75) of section through the hernial sac in a patient who had developed an induration of the cord following injection of thuja solution. Fibrous tissue is shown forming between the 2 surfaces of the sac. This indicates the mechanism of closure of the sac if the hernial sac is inadvertently injected. Undesirable but not necessarily harmful.

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*Sodium psylliate:—Sylnasol-Searle.

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ACUTE CORONARY OCCLUSION

Points on Diagnosis and Treatment

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The frequency of sudden deaths is constantly focusing our attention on coronary heart disease. As many as four such sudden deaths were autopsied by Timothy Leary, the Medical Examiner of Boston, in a single day[1]. In some cases death may be the first symptom; in others, prolonged anginal pain with substernal oppression, dyspnea, epigastric distress, (often with nausea and vomiting), frequently a weak, rapid pulse, feeble heart tones, gallop-rhythm, irregularity in the pulse or heart tones, most frequently due to extrasystoles and occasionally to ventricular tachycardia and the other arrythmias, signs of shock, cyanosis, pallor, pulmonary edema, Cheyne-Stokes respiration, a fall in blood-pressure, particularly when the blood-pressure has been previously high; after a day or two, fever, leukocytosis, pericardial friction, transient glycosuria, embolism in the brain, spleen, kidneys, lung, or a typical electrocardiogram, complete the picture.

Often the physical findings are few; indeed, there may be no characteristic objective signs at the time of the examination. A careful, detailed history is, therefore, of the utmost importance[2]. In evaluating the history I have found an arbitrary division of patients, according to their predominating symptoms, an aid in recognizing the true nature of their illness.

1. There is the common type, with the anginal syndrome of severe substernal pain, a "constricting" or "crushing" sensation, frequently radiating to the shoulders, arms, jaw, back, neck or abdomen, lasting for an hour or more, relieved only by morphine, and then often only to a partial extent.

2. In others epigastric distress, with nausea and vomiting, may be the predominating feature, especially in the middle aged, these folks often volunteering that they have eaten something that has poisoned them, and "surely nothing is at fault with the heart."

3. Again, there may be a sudden onset of dyspnea, occurring while sitting or reclining, or coming on at night in paroxysms, the so-called attacks of cardiac asthma. This symptom occurs more frequently in elderly individuals, in contrast to the younger sufferers who are more often afflicted with anginal pain.

4. There remains a not inconsiderable group who do not fit into the preceding arbitrary divisions and have no characteristic complaint, being only vaguely conscious of not feeling quite well. They may have weakness, faintness and sometimes syncope, yet all the usual findings we have learned to associate with coronary occlusion are absent. It is here that diagnosis is often too long delayed, and death too frequently results, perhaps from neglect of the all-essential prolonged bed rest and nursing care so necessary to the satisfactory healing of a myocardial infarct. If leading questions are asked, these patients will sometimes admit slight dyspnea, and some may have felt discomfort in the chest, although there may be no sensation of actual "pain." A brief summary of the case histories of three such individuals will serve to emphasize that group of so-called "silent" coronary accidents:

Case 1. A male patient fifty-two years of age complained of several attacks of weakness, the first coming on one Sunday in the early part of June, 1935. Following a hearty dinner he became faint, broke out into a perspiration, and with difficulty walked into his bedroom and lay down on the bed. Within an hour he recovered, and was able to attend business the following day, remaining free of symptoms for two weeks, when there was another attack of weakness, this also coming on after eating. On arising from the table he fell over, losing consciousness momentarily. These

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experiences were not associated with heart disease, the complaint being extreme weakness, which continued. The attacks became more frequent, finally forcing him to decrease his hours of work.

Such was the history volunteered by the patient when seen on September 5, 1935, three months after the first attack. When questioned, dyspnea on walking up stairs was admitted, although he maintained that he climbed "Elevated" station steps with no more shortness of breath than his friends experienced. Continued questioning revealed that he had experienced a vague sensation in his chest, hardly classified as discomfort, and usually noted upon going out-of-doors into colder air.

The heart tones were weak, rapid and irregular, with the characteristic irregularity of extrasystoles. Blood-pressure was 105/70. An electrocardiogram showed evidence of a recent myocardial infarction, of the "T_1" type, and an old one of the "T_3" type. The cause of his illness was explained to him, and he willingly remained in bed, with nursing care. Yet on the tenth day he succumbed suddenly upon sitting up in bed.

Case 2. A sixty-eight year old male patient on the eighth post-operative day, convalescing from a simple cystotomy, following the first-stage operation for a prostatectomy, suddenly became faint while turning over in bed during his bath; his pulse was weak, extremely rapid and at times imperceptible, his face ashen, and lips cyanotic, and within a few minutes he lost consciousness. Caffiene sodium benzoate was administered, and within a few minutes he regained consciousness. He recovered to about his former state of convalescence and had no specific complaint, although he was alarmed over the fainting attack and did not feel quite so strong.

The electrocardiogram showed a typical curve for myocardial infarction, of the "T_3" type, confirmed by subsequent serial records over a period of two months, during which time he was kept absolutely in bed, with good nursing care. During the early part of his rest oxygen and intravenous glucose were administered. After two months he was allowed to be up at increasingly longer intervals. At the end of three months he had made an uneventful recovery.

Case 3. A well-preserved active man of seventy-nine years, while attending church services suddenly felt weak, lost consciousness and sank to the floor. After a few minutes he was able to get up and go home in his car, with the help of friends. His only complaints were slight dyspnea and a feeling of weakness. An electrocardiogram showed evidence of an acute coronary occlusion, with myocardial infarction of the "T_3" type.

In addition to a careful history and physical examination, valuable information may be derived from the electrocardiogram; in fact, it may be essential not only to confirm but to make a diagnosis. In evaluating the electrocardiographic evidence the serial studies of at least three four-lead electrocardiograms, taken a week apart, should be considered. Single electrocardiograms, especially when the findings are doubtful or negative, are inadequate and often misleading, as I have previously shown.[3]

In reviewing the serial records we first note the early injury currents producing deviations of the R-T intervals, followed by inversion of the T-waves. The electrocardiograms usually follow one of two groups, namely, the "T_1" and the "T_3" types[4, 5]. The "T_1" pattern consists of an early elevation of the R-T interval in Lead I., and frequently also in Lead II., with often a reciprocal depression of the R-T interval in Lead III. and absence of the initial downward deflection in Lead IV[6]. Usually within a week the current of injury subsides and the R-T interval deviations approach or come to rest at the isoelectric line, the T-waves being deflected in the opposite direction to that of the corresponding R-T interval; that is, T_1, and frequently T_2, becomes inverted, whereas T_3 is upright. In the fourth lead while the R-T interval tends to approach the isoelectric line T_4 may or may not become diphasic or upright.

In the "T_3" configuration immediately after infarction the injury current gives rise to an elevation of the R-T interval in Leads II. and III., with often a reciprocal depression of the R-T interval in Lead I. The fourth lead is not characteristic and usually does not change, although occasionally there may be a slightly increased R-T interval, with later an upright T-wave. Here, as in the "T_1" type, the injury current is not often active for more than a week or ten days. Subsequently the R-T intervals approach the isoelectric level, and the T-waves become deflected in the opposite direction to that of the previous R-T interval deflections; that is, the T-waves in Lead II. and III. become inverted, whereas the T-wave in Lead I. tends to be upright. Also, a large Q-wave is present in Lead III. and usually in Lead II[7].

Simultaneously with and in addition to these characteristic patterns of the two types, by reviewing the serial electrocardiograms we often note in the constantly changing picture other phenomena found in both types, such as: 1. A lowering of the voltage of the QRS complexes[8, 9]. 2. The development of a prominent Q-wave in Leads I. and II., which tends to persist[10]. 3. Prominent P-waves often seen in Lead[11]. 4. Notching of the QRS complexes. 5. Arrhythmias such as extrasystoles, usually of the ven-

tricular type, paroxysmal tachycardias, frequently ventricular, auricular fibrillation and flutter. These arrhythmias are present in about 5% of the cases[12].

At times electrocardiograms will be seen which cannot be definitely placed in either the "T_1" or the "T_3" group. However, when the above described curves are observed in a series of electrocardiograms in which the form is constantly changing, there is no difficulty in diagnosing a myocardial infarction. It is thought by Barnes and Whitten[5] and others that localization of the infarct can be made when the electrocardiogram corresponds to the "T_1" or the "T_3" type.

A lesion posteriorly at the base of the heart (EKG of the "T_3" type) is thought by some to have a better prognosis than an infarct in the apex, in the anterior surface (EKG of the "T_1" type), and there are those who feel that a shorter period of bed rest is therefore justified for the latter group. One of the reasons advanced for this opinion is that the heart wall is thicker at the base than at the apex, and, therefore, more tissue can be destroyed without a fatal result.

Conditions other than myocardial infarction, such as acute infectious diseases, especially diphtheria and rheumatism, uremia, pericarditis with effusion, drug poisonings, as digitalis and quinidine, massive pulmonary edema, dissecting aneurysm of the aorta, and spontaneous left sided pneumothorax, have been said by some authors to give electrocardiographic curves similar to those of coronary occlusion. Where serial records are obtained and correlated with the clinical history, it is rare that any such difficulty will arise.

In considering the treatment, a prolonged period of bed rest, of at least two or three months, is of primary importance, the patient not being allowed to do anything for himself, even being turned over in bed and fed by the nurse. Pain should be relieved by morphine, given in sufficient doses and frequently enough to relieve pain and promote rest,—¼ to ½ gr. every hour or half-hour for two or three doses is often necessary. Severe shock, with collapse, should be treated symptomatically, using caffeine sodium benzoate, oxygen by tent or nasal catheter, intravenous glucose, and external heat. The long-continued use of oxygen is often attended by gratifying results, not only in those patients with marked cyanosis, but in those with frequent or continuous pain and weakness. While the length of bed rest may be estimated somewhat by the severity of the attack, the subsequent condition of the patient, and the electrocardiographic findings, yet no standard set of rules can be laid down, as each patient is an individual problem. In those with mild symptoms, and minor or transient serial electrocardiographic changes, the period of bed rest may often be shortened, as transient electrocardiographic changes characteristic of coronary occlusion may occur, with temporary ischemia of the involved myocardium, without death of the tissue; that is, the area of ischemia is supplied with sufficient collateral circulation to avert infarction resulting[13]. However, it is my opinion that many patients with minor symptoms or "silent" accidents have lost their lives by an insufficient period of bed rest, whereas, on the other hand, I have seen those with severe anginal pain, collapse and subsequent myocardial decompensation, —those with pulmonary edema, hemoptysis, and enlarged livers—who have recovered to good health, perhaps due in some degree to their frequently two, three and four months of absolute rest in bed.

In summary and conclusion, we have attempted to show:

1. That an arbitrary division of the patients with coronary occlusion according to their predominating symptoms is an aid to diagnosis.

2. A careful history supplemented by serial four-lead electrocardiograms often makes the diagnosis clear, and is especially helpful in the so-called "silent" group.

3. Adequate bed rest and constant nursing care is the most essential part of the treatment, and if instituted early may save the lives of those patients suffering coronary accidents with obscure and apparently insignificant symptoms and findings.

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DISCUSSION

Dr. James A. Walsh: This paper, as presented by Dr. Richter is commendable, particularly because of its completeness, and because he has given us an additional refinement in the study of coronary occlusion. There does not remain much to discuss when practically all of the details of the history, diagnosis and treatment have been reviewed.

However, I think there are a few points that might be mentioned. First of all, most of the patients and the relatives are interested in the prognosis as well as in the diagnosis. With the assistance of the electrocardiogram the former may be predicted more accurately in some instances. It has been my experience that patients showing a T1 type of electrocardiogram, and those with marked changes in the QRS complexes, do not do well. On the other hand, those with the T3 type have been more fortunate. This is of some value.

In the review of the treatment, you may have noticed that digitalis was omitted. I think this was purposely done. This drug, and those of similar pharmacological action, have no place in the treatment of this disease. The routine use of digitalis is fraught with far more danger than good. You have, after infarction, an already irritable myocardium and digitalis may set up an ectopic rhythm that may end with sudden death. Its only indication is marked congestive failure, and this is not common. The administration of quinidine from the beginning is advocated by many. I believe it is of real value. Patients who, after coronary occlusion, develop frequent extrasystoles, persistent auricular fibrillation or flutter, or paroxysmal tachycardia are in danger. These disorders of rhythm may be arrested and perhaps prevented by the use of quinidine. It must be given cautiously and discontinued with the advent of the usual signs of quinine intoxication, excessive sinus tachycardia, or intraventricular block, as detected by the electrocardiogram. I do not often use the vaso-dilating drugs. However, I have recently seen a case of persistent substernal pain, relieved by aminophyllin intravenously.

In conclusion I should like to say that although our primary concern this afternoon has been the diagnosis and treatment of acute coronary occlusion, it might be well for us to turn our attention and devote more thought and time to the prevention of the disease.

Dr. Richter: (Closing remarks): You will note the title of the paper was "Points on Diagnosis and Treatment." It is impossible to cover the whole subject of acute coronary occlusion in the twenty minutes allotted. I have used the vaso-dilators, especially the theophylline and theobromine compounds at times with apparently favorable results.

I agree with Dr. Walsh that quinidine is of value in both the treatment and prevention of ventricular tachycardia. Digitalis is to be avoided, except in rapid auricular fibrillation and in selected cases of late congestive heart failure. In my experience digitalis at times appears to increase the irritability of the myocardium and favors the occurrence of extrasystoles and ventricular tachycardia. Theoretically it may further injure an already damaged heart.

Regarding the prophylactic treatment, there is some evidence that the condition is more common in the hypertensive, nervous individuals, especially those of sedentary habits, as compared to those who do manual work.

When we learn how to prevent atherosclerosis and arteriosclerosis we will also have solved the etiology of coronary thrombosis.

636 Church Street.

RENAL AND URETERAL ANOMALIES

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The incidence of renal and ureteral anomalies in the past several years, has served as a topic of intensely interesting medical discussion for the general practitioner, urologist and radiologist alike. The large number of these anomalies seen and diagnosed since the advent of intravenous or excretion urography is tremendous. Formerly, many of the indefinitely defined renal complaints resulting from these various malformations were overlooked or disregarded because of the hesitancy of physicians to submit these patients to the procedure of retrograde urography in the absence of a positive clinical indication. With the advent of the intravenous method, more and more of these patients were given the advantage of a rather thorough and comprehensive urologic and urographic examination. The result has been a definite increase, not only in roentgenographic urology, but in the number of these patients referred to the urologist for further observation and care.

Abnormal or altered urinary tract function and malformations with evidence of pathologic changes resulting, may be readily demonstrated by means of both excretion and retrograde urography, hence this should not be construed as an argumentative point in favor of either method. Both procedures are excellent, each has some advantage over the other and frequently, when used on the same patient, one

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will give information not obtainable by the other method.

A normal intravenous pyelographic response however, generally results in the elimination of the urinary tract as a cause of the complaint. An abnormality, on the other hand, usually results in a hurried call for competent urologic consultation and advice. Then, if deemed necessary, retrograde urography should be utilized to obtain additional information and to definitely settle the diagnosis as due to renal or ureteral changes. This type of cooperation has brought out the fact that many more of the different types of anomalies exist than were formerly suspected. Further, it has been shown that these anomalies or malformations not only exist, but that they are frequently the direct cause of the pathologic process producing the so-called indefinite renal complaints. It has recently been stated "that fully 40% of all pathologic conditions of the kidneys and ureters are due to congenital anomalies, and that these malformations constitute the most extensive chapter in modern urology."

Renal and ureteral malformations predispose to pathologic changes through altered function of the organs involved, frequently resulting in urinary stasis or retention. Hydronephrosis, pyuria, pyelitis, nephritis, calculus, hydroureter, and ureteritis, to mention some of the possibilities, are often the result of anomalies.

The number and types of these anatomic variations is so great that a full discussion of the different varieties would be impractical. A brief summary of those most frequently seen would include:

1. Kidneys:
   - (a) Variations in number, from total absence to multiplicity.
   - (b) Variations in size and shape including,
     1. Cystic,
     2. Polycystic,
     3. Fused, or horseshoe kidney,
   - (c) Variations in position and rotation,
   - (d) Variations in internal structure including abnormalities in the number, size, shape and position of the renal pelves and calices.
2. Ureters:
   - (a) Variations in number including:
     1. Bifurcated with single bladder opening,
     2. Reduplication with separate openings.
   - (b) Variations in size, shape, and position,
   - (c) Diverticula, and
   - (d) Obstruction.

Any of these malformations may be unilateral or bilateral.

The clinical manifestations of these anomalies vary with the individual patient. Many of the patients present complaints that are not directly referable to the urinary tract, hence thorough clinical and laboratory examinations are necessary to eliminate the gastrointestinal tract, the gallbladder and the pelvic organs as the source of the complaint. Others may present definite clinical evidence of renal changes, that varies with the type of pathologic process producing the complaint. Not infrequently, the patients presenting the most leading clinical manifestations show a minimal amount of pathologic change and some of those patients with most extensive changes and obvious malformations give little or no evidence pointing to the urinary tract as the source of the trouble.

A patient with a complaint of fullness in the upper right side of the abdomen was found, upon physical examination, to have large nodular tumor masses in both upper abdominal quadrants. Intravenous and retrograde pyelograms demonstrated these masses as large, bilateral polycystic kidneys.

The mother of a youngster with a congenital, pelvic ectopic kidney, stated that the child had a sore spot in the lower abdomen, and that he urinated frequently.

A history of repeated attacks of pyelitis was given by the mother of a child who was found to have an extensive hydronephrosis resulting from an aberrant vessel to the lower pole of the kidney.

Typical clinical pictures of ureteral calculi were given by two patients; one with a horseshoe kidney, the other with a bifid renal pelvis.

A patient complaining of incontinence, dating from birth, was found to have a complete reduplication on one side, with an ectopic ureteral opening in the urethra.

Lower abdominal distress was the complaint of a patient with a horseshoe kidney.

The roentgen findings in most of the well developed anomalies are usually sufficient in themselves to enable a conclusive opinion relative to the type of malformation present and they frequently demonstrate the type of pathologic change resulting. The preliminary or flat film will ordinarily reveal the size, shape, posi-

tion, and number of kidneys, and also the presence of radiopaque calculi.

The pyelographic examination will of course give necessary information relative to the internal structure of the renal pelves and the inner diameters of the ureters. The identification of most of the anomalies is, as a rule, perfectly obvious to medical observers, each having characteristics which serve to differentiate it from the other types. The roentgen evidence of some of the most frequently seen anomalies is given briefly to recall some of the salient features.

1. *Double pelvis and ureter.* There are many variations of this anomaly including bifid pelvis with single ureter, double pelvis with bifurcated ureter and single bladder opening and complete reduplication with double pelvis and double ureter extending to and both opening in the bladder. These may be unilateral, or they may be bilateral. The only evidence suggesting these anomalies on the flat film is the elongation of the kidney shadow. Positive identification depends upon the pyelographic examination. The pyelograms with completely filled pelvis and ureter show the division of the kidney into two pelves. The upper pelvis is frequently small and of a rudimentary type without clearly differentiated major and minor calices. Dumb bell type of pelvis is perhaps the most descriptive name for this deformity. The lower segment or pelvis is generally more nearly normal in appearance with well developed major and minor calices. Recognition of one of these dumb bell type pelves in a pyelogram should immediately suggest a double pelvis. Ureterograms will demonstrate the presence of bifurcated or double ureters and their point of entrance to the bladder. Urinary retention in the upper pelvis frequently results in hydronephrosis and occasionally calculi may be seen.

2. *Polycystic kidneys.* Large, irregularly outlined, ovoid masses, frequently extending from above the costal arch to the iliac crests may be seen on the preliminary film, in the presence of polycystic kidneys. Generally these are bilateral, but occasionally unilateral polycystic kidney is seen. The psoas muscle shadows may or may not be obscured. The pyelograms give a rather bizarre pelvic picture, with markedly elongated, spider-like thinning and irregularity of the major and minor calices, and rounding or occupying of the calices about individual cysts. This is one condition in which the intravenous pyelographic method should be preferred to the retrograde because it eliminates the admittedly slight possibility of introducing trauma and infection in an already badly damaged kidney.

3. *Horseshoe kidneys* may be recognized on a properly made flat film. The isthmus fusing the two kidneys can be seen passing the midline and joining the kidney shadows proper. More conclusive evidence of this condition is obtained by pyelographic examination, the ureters pass lateral to the normal course and join the renal pelvis on the lateral side. The kidney pelves appear to be reversed or rotated with the calices pointing medially toward the midline instead of laterally as seen in a normal kidney. Occasionally the two pelves communicate with one another through fusion of the inferior calices.

4. *Aberrant vessel.* This is usually associated with extensive hydronephrosis. The pelvis is markedly distended and the calices so dilated that differentiation of major and minor calices is next to impossible. The ureteropelvic junction shows a constant small filling defect and in the absence of complications the ureter below is about normal in size.

5. *Ectopic kidney.* Absence of the kidney shadow on one side may be found in either congenital ectopic kidney or in a patient who has only one kidney. The pyelogram will, in the absence of obstruction, show the ectopic position of the kidney and the marked shortening of the ureter.

Case 1. Patient, a white female, aged 35 years, married, has two children. Complaint, fullness in the right upper quadrant of the abdomen. Past history essentially negative. Physical examination revealed a palpable tumor mass on both sides of the abdomen. The urine showed only a faint trace of albumin. Preliminary film showed the kidney shadows markedly enlarged. The kidney pelves were well filled following the intravenous use of diodrast. The pelvis presented a bizarre appearance, with unusually long, thinned calices and cupping about individual cysts. Retrograde pyelograms were used for confirmation, conclusion: bilateral polycystic kidneys.

Case 2. Patient, a white male, aged 26 years, had passed a small urinary calculus; no immediate complaint. The preliminary roentgenogram showed the kidney shadows low, with the lower poles close to the midline and apparently joined to one another by an isthmus of soft tissue which crossed the midline and appeared to coalesce with the kidney

shadows. Intravenous pyelograms showed the kidney pelves well filled. The pelves were reversed or rotated with the calices projecting toward the spine and the uretero-pelvic junctions were on the lateral sides of the kidneys, conclusion: horseshoe kidney with no evidence of calculus.

Case 3. Patient, a white female, aged 21 years, married, complained of pain over the right side of the abdomen. Preliminary film showed no evidence of renal shadows. Retrograde pyelograms showed the ureteral catheters in situ, following a normal course to the level of the fourth lumbar vertebra, where they curved laterally to give the "flower vase position," and joined the kidneys toward the lateral sides. The renal pelves were of the reversed type with most of the calices pointed medially. The right renal pelvis was moderately pyelectatic and the calices were clubbed, indicating right hydronephrosis in a horseshoe kidney.

Case 4. Patient, a white male child, aged 11 years, complained only of a feeling of fullness in the left lower quadrant of the abdomen. Mother stated that a tumor mass had been found by a pediatrician during the course of a routine health examination. Preliminary film and intravenous pyelogram showed a normal, but slightly enlarged right kidney, but no evidence of a left kidney shadow, nor of any dye in the kidney region. The palpable pelvic tumor on the left side could not be seen. Retrograde pyelography was attempted, but the progress of the ureteral catheter was arrested just above the bladder and none of the dye passed beyond the tip of the catheter, most of it flowing refluxely into the urinary bladder. The bladder was somewhat displaced to the right. There was no evidence of urine passing through the ureteral orifice. At operation the child was found to have a congenital non-functioning, ectopic pelvic kidney with a short constricted ureter. The pathologist reported very little evidence of renal tissue in the sacculated remnant of the kidney.

Case 5. Patient, a white male child, aged 13 years, had had frequent attacks of pyelitis with continuous pain over the right kidney region. Many pus cells were found in all urine specimens examined. Retrograde pyelograms demonstrated a normal left kidney and a markedly enlarged right kidney, with extensive pyelectasis. The pelvis seemed to almost completely fill out the right kidney shadow. There was a persistent, small band-like filling defect at the right uretero-pelvic junction, which was interpreted as an aberrant vessel partly obstructing the ureter. The lower ureter was a little irregular in contour, otherwise normal in appearance. Operative attempt to relieve the constriction met with failure and nephrectomy was performed and followed by complete recovery.

Case 6. Patient, a white male, aged 43 years, complained of soreness over the left kidney region and gave a history of several attacks of left renal colic. Urine examination showed considerable blood. A small calculus was found on preliminary roentgenogram. The retrograde pyelograms revealed a bifid type of pelvis, with the stone shadow included in the lower half of the pelvis. The calices were slightly clubbed. This was felt to be an embryologic attempt to form a double kidney. There was only one ureter. The calculus was removed at operation and followed by complete recovery.

Case 7. A double pelvis, with a bifurcated ureter. The branching of the ureter occurs at the level of the second sacral vertebra. The kidney shadow is unusually long, characteristic of a double pelvis. The upper pelvis is of the dumb bell type, and the pelves and ureters are slightly dilated and distended, giving the impression of hydronephrosis and hydro-ureter.

Case 8. Complete left reduplication, with two independent ureteral openings on the left side of the urinary bladder. The upper pelvis, of the dumb bell type, is moderately pyelectatic and the proximal portion of the ureter is definitely dilated, indicating hydronephrosis and hydro-ureter. The right kidney has a single pelvis and ureter. The pelvis is moderately dilated and the ureter is kinked.

Case 9. Patient, a white female, aged 24 years, chief complaint urinary incontinence since childhood. Cystoscopic examination revealed one ureteral opening in the posterior urethra on the right side and two normal ureteral openings in the urinary bladder. Three ureteral catheters were inserted, retrograde pyelogram showed complete right sided reduplication with the ectopic ureteral opening in the posterior urethra draining the pelvis of the upper kidney. The left kidney was normal. There were scattered opacities medial to the left kidney region, apparently calcified glands. Heminephrectomy resulted in complete recovery.

Case 10. Patient, a white female teacher, complained of pain in the right lower quadrant of the abdomen. Cystoscopic examination showed the ureteral openings in normal position. The pyelogram did not show any anomaly or pathologic change. Ureterogram, however, showed a branched ureteral diverticulum passing upward at about the level of the first and second sacral vertebrae on the right side. This was interpreted as an embryologic attempt at the formation of a bifurcated ureter with double pelvis, but the process was arrested before these changes developed.

CONCLUSIONS

1. The incidence of rental and ureteral anomalies or malformations has increased tremendously in recent years, due to more thorough and comprehensive genitourinary examination.

2. Recognition of these variations as potential sources of pathologic changes, rather than as mere anatomic curiosities has resulted from the study of many cases.

3. Both retrograde and excretion urographic

methods give valuable information relative to the presence of these anomalies and enable the diagnosis of associated pathologic changes.

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DISCUSSION

Dr. Roswell T. Pettit, Ottawa: This paper is interesting to me because I had a patient come to me yesterday, a young woman nineteen years of age, married with no children, never had been pregnant, complaining of general abdominal distress. The doctor who referred her thought she should have a gastrointestinal examination. Most of the symptoms pointed to a vague indefinite gastrointestinal distress. I asked a number of questions and palpated the abdomen. She had tenderness and rigidity in the lower part of the abdomen on the right side. In pressing on the abdomen on the lower left side she had some tenderness, but she said it was not as marked as on the right side. The urine was negative as far as any blood or pus was concerned. The doctor referring her to me had had her under observation for six or seven months and was rather going blind on the thing. I felt the symptoms pointed to the urinary tract. It seemed to me the tenderness radiating to the flank on both sides rather indicated a urinary disturbance more than an intestinal.

We decided to begin our examination with an intravenous pyelogram. Very much to our surprise we found a double ureter and double pelvis of the kidney on both sides. Of course, it was a developmental abnormality. It is a question in my mind whether the double pelvis and double ureter would account for symptoms such as she had. We intend to refer her to a urologist but I would like to ask Dr. Furey whether the symptoms of vague abdominal distress with tenderness in the lower part of the abdomen on both right and left side could be caused by a developmental abnormality of that sort.

Dr. M. I. Kaplan: There is one point in the examination of the urological tract that has never been stressed which in my opinion plays a very important part in helping to make the diagnosis. That is the comparative size of the calices with the kidney proper. We may find large calices in a very small kidney and small calices in a very large kidney. I think the reason it has not been stressed is because most of the patients who come to us for radiographic study of the urinary tract have had renal colic and have been getting opiates of various types and individuals who receive morphine or any opiate usually get a distention of the intestinal tract, the gas filling out the intestines and obliterating the shadow of the kidney. The shadows as seen by the pyelogram, whether by retrograde or intravenous method usually stand out very clearly without showing as clear an outline of the kidney itself. I am wondering whether Dr. Furey or others have used the new drug pitressin to see whether it really will cause expulsion of the gas without causing any disturbance to the patient. They claim the injection of this drug causes dehydration; therefore the intravenous pyelogram will be more concentrated, and by causing the gas to be expelled brings out the shadow of the kidney more clearly. I have not used it.

I am wondering whether we are not missing out on some very valuable points in diagnosis where we make a diagnosis of a normal kidney because the calices appear normal, the pelvis appears normal but you do not get a comparative study between the calices, pelvis and kidney itself.

Another point I wish to bring out is that the use of either intravenous or retrograde pyelogram in polycystic kidney is rather a dangerous procedure. I have some one very close to me whom we almost lost because of the intravenous pyelogram taken in a case of the polycystic kidneys. Another case I recall is one that almost died because of the retrograde use of the dye in polycystic kidneys. I think one can tell almost as much from the ordinary flat film as from the intravenous or retrograde study in these cases.

Dr. T. J. Wachowski, Chicago: We have had a little experience with pitressin put out by the Parke Davis Company and prostigmin put out by the Roche Company, after we saw the exhibit from the Detroit Receiving Hospital in December at the radiological meeting and find it pretty good. Dr. Lindon Seed of the University of Illinois has been working with pitressin and finds it does produce anuria for about twenty-four hours. We also dehydrate our patients prior to intravenous pyelography withholding fluid from about six o'clock the evening before and have had good shadows. We find no evidence of decreased excretion of the dye and it will cause the patient to have a bowel movement and expel all the gas. So far we have had no contraindications to its use except hypertension, persons suspected of angina and possibly debilitated cases.

Dr. Harry Olin, Chicago: I would like to emphasize one point in relation to aberrant vessels in connection with some of these congenital anomalies of the kidney. It has been shown that if the aberrant vessel is not ligated in order to conserve the proper nutrition of the kidney and since most of the ureter is either tortuous or redundant, the surgeon I think most times will seek to transplant the ureter in order to release pressure from the vessels overlying the ureter. As roentgenologists, we should bear in mind that some of this destructive work, as taking out half the kidney or sometimes the whole kidney, may be avoided if the circulation of the aberrant vessel remains intact and is not interfered with.

Dr. Furey (closing the discussion): I would like to say in answering Dr. Pettit, that the cases I have seen were those in which the complaints have been directly referable, not to the anomalies themselves, but to asso-

ciated pathologic changes resulting from the presence of the anomaly.

Dr. Pettit: There was no pus in the urine.

Dr. Furey: Many calculi and other pathologic urinary changes are unaccompanied by pus and blood in the urine. It is not uncommon to find normal urine with anomalies. The thing which impresses me about these patients is that most of them, except those in colic, have no complaint of any kind pointing to the kidney as the source of the trouble, but in almost every one we have been able to show some pathologic change resulting from the anomaly.

Dr. Pettit: Do you think an anomaly of this sort would cause these vague gastrointestinal symptoms?

Dr. Furey: If the kidney and the pelvis were normal, without apparent mechanical obstruction, I would say, no. In the cases we have seen the complaints have nearly always resulted from the pathologic change and not from the anomaly.

What Dr. Kaplan has said is well taken. I have tried to show slides that demonstrated the anomalous condition best, and not those of the normal side. It should be remembered however that bilateral pyelograms are essential for complete diagnosis.

CARCINOMA OF THE COLON

D. B. Freeman, M. D.

MOLINE, ILL.

Until the day arrives when the specific cause and cure of carcinoma become known, it is obvious that we will have to continue to try to overcome this dread disease with the means at hand. It is equally true in carcinoma of the colon as well as in any other malignancy that if an early recognition of this condition is possible, it is much easier to cure. The general characteristics of carcinoma of colon being the same as any other malignancy, we go on the hypothesis that this condition is at first localized and then and only then is it amenable to treatment and cure no matter what procedure is followed. This paper does not permit a lengthy discourse on the theories of the cause of carcinoma but the views expressed and the suggestions made are in accordance with the common accepted knowledge concerning this disease. With so much research being done all over the world and with the ever increasing knowledge of malignancy, it is to be hoped that before many years are passed, the true nature and a specific cure of this condition will have been found and that we can definitely place our finger on that elusive something which causes these malignant reactions, masses or processes which we call cancer.

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It is the purpose of this paper then to point out some of the known and important factors concerning carcinoma of the colon. Since the colon is a large organ or a large part of the intestinal tract, it is obvious that malignancy as affecting one part would be different from that affecting another and the symptoms produced would vary. Therefore, the physiological and anatomical characteristics together with the general characteristics of the growth to a large extent determine the symptoms relative to the location of the carcinoma.

The physiologic function of the colon as we know is digestive, absorptive and propulsive. The right half of the colon beginning at the cecum and to the middle of the transverse colon functions more as digestive and absorptive, absorbing water and mineral. The remaining part of colon acts more as a storage and its main function is one of propulsive, passing the contents, at this point much less liquid, into the rectum for evacuation. Peristaltic waves are similar to those of the small intestine but vary. There are also waves of reverse peristalsis and circular muscle contraction to churn the contents so as to further increase absorption. When absorption is completed there are waves of mass peristaltic action to pass the contents on. The malignancy is more prone to appear at certain points of constriction or irritation. Seemingly also, this has a lot to do with the types of growth found of which there are two main types:

1. The adenocarcinoma cubical celled or the expansive type—the tendency in this type is to grow outward to form large massive growths, grows more rapidly, is more infiltrating and spreads by continuity. This type is also more prone to infection, abscess and sinus formation: is ulcerative and bleeds easily and is more common in the right half of the colon and not so prone to obstruction.
2. The second type—the adenocarcinoma cylindrical celled or annular type has a tendency to grow into the lumen, to contract the bowel and to produce obstruction—the mass as a rule is smaller, grows slower and tends to affect the left half of colon more frequently.

There is a third type, less common, the so-called gelatinous carcinoma. This is of a large massive type containing gelatinous or mucoid material within the carcinomatous cells. Very often these grow in large masses filling the entire abdomen, being lobulated some of which shell out en masse. Carcinoma of the colon is usually single but may be multiple, but is rarely so.

Distribution of the lesion or the order of frequency in Lahey's series which corresponds very closely with other observers, is as follows:

	Approx. Per cent.
Rectum and rectosigmoid	58
Sigmoid	13
Cecum	9
Descending colon	5
Transverse colon	4
Ascending colon	3
Hepatic flexure	3
Splenic flexure	2

Carcinoma is slightly more common in males but rectosigmoid is much more common in males than females.

Now as to the symptoms; there are none that are strictly pathognomonic and all symptoms are vague in the beginning. The insidiousness of the disease is largely responsible for these cases coming to us for diagnosis late and reduces the likelihood of cure. The patients are usually of middle age or past forty although many cases occur earlier so we must not lose sight of this fact in the diagnosis. These patients have usually been previously free from digestive disturbances with no change in diet. Since these symptoms are vague and numerous, it is highly important to get a complete history of any and all symptoms since some are present and other absent.

Usually the earliest symptoms are digestive disturbances such as diarrhea or constipation or sometimes both, alternating, though pain may be the first sympton—then later there is the abdominal soreness, pain or cramps, soreness around the umbilicus, distention of the abdomen, gurgling and rumbling of gases, belching, nausea and vomiting, mucus, pus and blood in the stools, tenesmus-feeling of incomplete emptying of the bowel, loss in weight, beginning anemia and soon the presence of the tumor, visible peristalsis in the obstructive type, fever when accompanied by infection and then lastly the typical picture of cachexia. When all symptoms are present the picture is one which diagnoses itself, therefore, we must begin action with only a few of the vague earlier symptoms.

Given these symptoms, we must supplement our general examination with the examination of the blood, urine and the feces. Continue the examination with the fluoroscope and the x-ray, not only with the barium meal but just as important or more important the opaque enema and also the proctoscopic examination and the examination with the finger in the rectum. The type of pain may give us a clue since the pain is more or less constant dull ache, with tenderness on examination or pressure, the location of pain being as a rule, in the region of the part involved, pain around the umbilicus referring especially to involvement of the transverse colon. The pain is rarely severe enough for an opiate except in the obstructive type and unlike the gallstone colic or a pain from appendicitis or strangulated hernia.

Any change in habit of bowel movement should mean something. A patient who has always been regular, develops an irregularity, either diarrhea or constipation. Be suspicious of any symptoms, however inconsequential and investigate thoroughly. It is much more difficult to discover early malignancy of the colon than most other abdominal conditions. If a mass, no matter how small is found in the abdomen, it demands immediate diagnosis and immediate exploration if diagnosis cannot be made. Diagnosis is more readily made in slender than obese individuals, especially is this true relative to the palpability of the mass. In 5-10% the symptoms of acute obstruction bring the patient to the physician.

In the past year, a prominent physician came under my care with this condition—requiring immediate decompression. A colostomy was done and later an annular carcinoma of the rectosigmoid was removed. When this can occur in an individual who is trained to make diagnosis, how can one expect the laity to come for early examination? Briefly, on going over his history, he had lost some in weight but ascribed this to overwork. He had passed some mucus and blood but had had hemorrhoids intermittently for many years and ascribed the passage of blood to this condition. Those were the only two warnings he had except a slight

abdominal distress until the symptoms of an acute obstruction came on. However, had he considered the few symptoms present, he should have been suspicious of some pathological condition and been examined. At any rate, any patient coming for consultation with any one of these symptoms should be subjected to a thorough and rigorous examination. We must remember that hemorrhoids are often present in this condition, likewise, fissure and fistulae, any of which might cause blood to be present in the feces. When the carcinoma is in the sigmoid there is more tendency to tenesmus-feeling of incomplete emptying of the bowels. There are as a rule ribbon-like stools or small firm lumps are contained in the feces together with mucus, blood and debris. Blood is however, usually present in the feces in carcinoma located anywhere in the colon. I need only to mention distention of the abdomen, gurgling and rumbling of gas, nausea and vomiting, visible peristalsis and acute severe pain and toxemia to picture acute obstruction in this condition.

As a rule, there is nothing significant in temperature. In fact, most cases have no rise in temperature until late or it may be subnormal. However, in carcinoma about the cecum the large massive type with secondary infection, abcesses and fistulae, there is as a rule increase in temperature. The examination of the blood shows a progressive anemia, very often a leukocytosis. All of these cases should be fluoroscoped and given a barium meal and what is more important an opaque enema. When this is done, the suspicion is very often verified by these findings. The proctoscope helps us only, of course, in those cases involving the lower part of the colon but gives us definite information when the lesion is located there. This evidence may be augmented by digital examination of the rectum. A small percentage of these cases give us a history of a previous malignancy as of the skin or other structures of the body.

In considering the differential diagnosis, there are a few conditions which are most likely to be confusing. To mention briefly, they are the following: tuberculosis of the intestinal tract and peritoneal tuberculosis, enlarged menteric glands, intussusception, diverticulitis, chronic appendicitis, duodenal ulcer, cholecystic disease and if located in the splenic or hepatic flexure some kidney lesions. However, intensive examination shows that most of these conditions have some symptoms which are not common to carcinoma of the colon.

The prognosis in carcinoma of the colon depends on numerous factors. It should be favorable because the neoplasms are limited and are usually slow in growth and are rather late to metastasize and the secondary lesions are usually located in the regional lymphnodes. It is unfavorable because of its late diagnosis. As a rule, a favorable prognosis can only be made if radical extirpation can be done early, before any visceral metastasis and glandular involvement have developed. Prognosis depends on the age of the individual, the older the patient the more favorable as the very young seem to be particularly malignant. Loss in weight is always a bad sign. The general condition of the patient is important—whether there is any cardiac or renal impairment. The amount of anemia or cachexia present should be noted. The duration of the disease whether of long standing or rapidly progressive. The presence of metastases is always a serious complication. Size, however, is not always a prognostication since some are very large and are still localized. However, if there is any fixation to the abdominal wall or to the surrounding viscera, it shows that the process is well advanced. The presence of infection as shown by abscesses or fistulae show it to be well advanced. Those which tend to grow outward, the larger type, are usualy worse than those which grow into the bowel. A further factor is heredity, since with a history of carcinoma in the family, there is a tendency for the host to be less resistant.

Summary and Conclusion: Summarizing briefly, we know that in order to relieve and cure this condition, we must first recognize the very earliest symptoms and then by further means of examination, make as early a diagnosis as possible in order that surgical intervention may be of benefit or accomplish its end. At present surgery seems to be the only method of attack in this condition. Carcinoma of the colon is usually not an emergency problem except in the acute obstruction, so careful preoperative preparations can be made. Given a patient even with an advanced carcinoma of the colon, if there is any hope of relief, he should by all means be given the benefit of surgical procedure indicated. If surgical intervention

for relief only is done such as a colostomy—an opportunity is afforded to determine extent of involvement and then the surgeon can determine if any further radical procedure should be instituted. In the removal of carcinoma of the colon many types of operation are performed. Choosing the type of operation is most important and requires keen surgical judgment and technical skill for its successful performance.

DISCUSSION

Dr. O. E. Nadeau, Chicago: Since we do not know the cause of cancer, the discussion of this subject of course resolves itself into early recognition and early treatment. Dr. Freeman has told us about making early diagnosis. This is the most important part of the subject. One phase should be taken into consideration, that is, the education of the public. They are getting more cognizant of the symptoms of cancer in general. They are hearing about cancer of the rectum and the changes in bowel habits, particularly after the age of 40, and if there is any pronounced change after that age, they get the idea that there might be some kind of obstruction. That is helpful.

Another thing is the education of the doctors themselves. They have improved a good deal. I was reading a series of examination questions and answers yesterday and found this subject well covered by senior medical students as to early symptoms and signs of carcinoma of the rectum. However, so far as certain procedures are concerned, they are no better than they were ten or fifteen years ago. One thing is about soiling their fingers. They know it is proper to do a rectal examination, but they do not like to do it. A greater proportion of doctors make rectal examinations now than was the case years ago, but some do not do so, and it is true that they are not being done as frequently as they should be done. This is especially important in view of the fact that about 70% of the cases are in the rectum or rectal sigmoid where they can be felt with the finger. Then there is the matter of introducing a proctoscope. It is not complicated. Just a tube long enough and wide enough with a glass on one end, with an air bulb for pressure—one can look in and see what the condition is. Of course, as to x-ray and all other methods which help in diagnosis, that should be done early.

It was very interesting to note Dr. Streicher's exhibit this morning. The average duration of symptoms is twelve to eighteen months. When a patient comes to the doctor he has had a year to a year and a half of symptoms. That is still a fact in spite of all the education that has gone on. As to treatment, there are two operations that every surgeon ought to learn to do who does emergency work. For instance, in the case of intestinal obstruction, do a cecostomy, pull out the cecum through a McBurnay incision and suture it to the skin. That will save a lot of cases with obstruction. Mikulicz's operation for carcinoma of the sigmoid is very simple. Any other surgery can be done later, but an operation of this sort frequently saves the life of the patient.

Dr. M. H. Streicher, Chicago: There are many interesting points for discussion in this paper. I wish to refer to some of these. I am certain that Dr. Freeman and Dr. Nadeau omitted these because of lack of time. It is important to recall that although the incidence of carcinoma of the colon is predominant on the left side, the operative mortality is considerably higher on the right side. Among other factors that may influence the incidence, is the difference in the distribution of the blood supply and the close proximity of the left ureter and the sigmoid. If one chooses the abdominoperineal method of resection he will of necessity consider the pelvic floor. It is interesting to note the controversy in the English literature as to whether the floor should be closed by suture or be permitted to close by scar formation. Apparently, fewer complications are met with in cases in which the floor is not closed by suture.

Dr. A. L. Stearns, Chicago: Many times you will find a palpable tumor on the right side which you are quite sure is carcinoma of the cecum, but upon x-ray examination, with the aid of a barium enema, it is found to be carcinoma of the sigmoid which has moved to the right side. I would also like to emphasize the importance of early examination of the stools for even traces of blood, which is very significant in early cases of carcinoma.

Dr. D. B. Freeman, Moline: The method of treatment of carcinoma of the colon could be discussed for the rest of the day, but there is one important thing to do if there is an obstruction, that is to relieve it, either by colostomy or cecostomy. It is also true that you might find the mass on the right side even in involvement of the sigmoid. Most of the time with a barium enema you can trace out the sigmoid pretty well. Operative procedures vary greatly, depending upon the location of the carcinoma.

OCCURRENCE OF VIRUCIDAL SUBSTANCES IN PATIENTS WITH POLIOMYELITIS: BEARING ON SERUM TREATMENT AND VACCINATION

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During the past year, attempts at vaccination of man against infantile paralysis have been made.[1,2] Although, suspended for the present,

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because of the suspicion that paralytic poliomyelitis followed vaccination in a few instances,[3] it is not unlikely that the same or similar methods will be tried again in man as soon as it is determined that the risk of vaccination is not unduly great. Suspicion has been raised in some quarters[4], [5] that convalescent serum has been without effect in treatment of the acute disease of man. While controversy still goes on concerning both active immunization and passive transfer of immune substance for therapeutic purposes, we would like to review the fundamental conceptions upon which these methods have been based.

Vaccination or active immunization has been carried out with monkey spinal cord bearing the virus of the disease, modified in such a way as to largely if not completely attenuate the virus (formalin, Brodie[1]) or slightly modify it by a substance long known to lessen the toxicity of certain bacterial toxins, sodium ricinoleate (Kolmer[2]). As a further preliminary argument prior to application of vaccine to man, it is said that a strain passed through monkeys has lost some of its infectivity for man. In addition, the route of administration (subcutaneous and intracutaneous) leads to but very few instances of the active disease even in experimental animals. However, in the instance of virus treated with sodium ricinoleate, it had been shown previously that such a preparation produced the disease in a few instances in experimental monkeys.[6] The presence of some live virus in this latter preparation was said to be an advantage[2] since it was believed that live virus was necessary for production of immunity. It was not surprising that the virus preparation mixed with sodium ricinoleate (Kolmer vaccine) did produce a number of instances of paralytic poliomyelitis[7]. The evidence for the danger of the Brodie vaccine is not clear cut. Fewer cases have occurred after administration of the Brodie vaccine. In three instances the interval between vaccination and the onset of the disease has been so long as to make it unlikely that the vaccine produced the disease. Epidemic poliomyelitis with proven opportunity for contact infection was present in the locality in all five of these instances. It is possible that another trial of this vaccine is warranted in interepidemic months. It has been shown that virus neutralizing antibody is produced after administration of these vaccines. The significance of this fact as an argument for the use of vaccine to protect against the disease is lessened by the finding by Aycock and Hudson[8] that sub-clinical immunization by natural dissemination of the virus proceeded at the same rate in unvaccinated persons in the same locality.

The question might be raised if man always acquires an effective immunity against poliomyelitis. In the United States and Canada during the past twenty years, 17 cases have been reported of a second attack occurring years after a first, including two cases that we have seen.[9] This is an attack rate of 11 per 100,000 calculated from the 150,000 reported cases. While these data are not statistically significant, this is many times the average rate for these years. The rarity of the disease during the first year of life and the low incidence among adults point to a relative immunity enjoyed by these groups. The fact that a large percentage of individual serums of these groups neutralize the virus of poliomyelitis is now well established and is the obvious explanation of these low attack rates. Are the neutralizing substances an accurate expression of immunity in this disease? Can resistance be present in their absence? Can the nervous system be invaded by the virus in the presence of neutralizing antibodies (humoral immunity)? Are there other factors of defense against the virus (mechanical factors and tissue immunity)? The replies to these questions would completely answer the question of effectiveness of poliomyelitis vaccination, were the data known. We will present below some experiments upon the acquisition of the neutralizing substances during an actual attack of the disease.

Pathogenesis of Poliomyelitis. Mechanism of Infection. The contributions of Fairbrother and Hurst,[10] Jungeblut and others[11] have established beyond peradventure that the virus of infantile paralysis travels largely if not exclusively in the body by neural pathways. Resistance to intranasal infection after section of the olfactory tracts, as well as blockage of spread of the virus after section of peripheral nerves are an adequate demonstration of this fact. It is considered that the nasal and pharyngeal zones are the usual if not the only portal of entry of the virus into the nervous system.

Indeed, it is probable that many persons har-

bor the virus in the nasopharynx, it being in more or less stable equilibrium with the host. Such conditions might be upset by exogenous factors. Tonsillectomy[12] and extreme muscular exertion[13] have been reported as precipitating an attack of poliomyelitis with the characteristic incubation period. The puzzling epidemiological fact, observed many times a year in the seasonal endemic poliomyelitis of this country, of cases occurring in isolated areas where personal contact can be excluded except through healthy intermediaries, may be explained by parasitization of the nervous system by virus carried in equilibrium with the nasopharynx. This hypothesis has already been confirmed by the isolation of the virus from the nasopharynx with subsequent development of infection. Kramer[14] has reported the isolation of the virus from pooled specimens removed by tonsillectomy in a general hospital. Ponderous technical difficulties do not allow the easy multiplication of such observations. The finding of large numbers of adults in the general population who carry neutralizing substances in their blood against the virus is indirect evidence of the widespread dissemination of the virus. From the practical point of view, there promises to be a method available that will increase the normal resistance of the nasopharynx to virus. Treatment of this area by alum, tannic and picric acids, and by mercurochrome has been signally effective in the hands of three groups of investigators[15] of the experimental disease. Application of these measures for prophylaxis in man awaits only the opportunity.

Origin and Occurrence of the Virus-neutralizing Antibodies. While contact with the virus is the only proven method of producing neutralizing substances in the blood of animals, there are a surprising percentage of human and monkey convalescents whose blood is devoid of these virucidal substances. Only recently has the blood of a large number of human convalescents been examined, and the full force of this fact become evident. These findings have been summarized by us in another publication.[9] The percentage of convalescents *without* neutralizing substances in the blood has varied in the hands of different investigators from 12.1 to 64.1 This later group was thought to be exceptional because they were treated in the acute stage with convalescent and antiviral animal serums. Of a total of 183 convalescents, 39.8% were without antibody.

On the other hand, a larger percentage of adults, drawn at random from the populace and who have had no obvious exposure to the disease, carry neutralizing substances in the blood stream against the virus. The incidence of antibody in this group ascends with increasing age. The analogy is quite similar to diphtheria, and may be due to repeated subclinical exposures to the virus. That the presence of these neutralizing substances signifies the immune state may be questioned in face of the newer ideas of tissue immunity. On the other hand, as quantitative data accumulates, the analogy to diphtheria may be drawn even more closely, as it is well known that a certain percentage of Schick negative individuals are susceptible to clinical diphtheria. In a tabulation[9] of the numbers of normal individuals chosen at random from the general population, 37, 58 and 73% respectively from the 0-4, 5-14 and 15 years and greater age groups possessed neutralizing substances against the virus.

No difference has yet been found between the virus neutralizing antibodies of "normal" human blood and those of convalescence. Although identical, there is a division in opinion as to their origin. Most investigators believe them to be the result of specific contact with subinfective doses of virus, but another group holds that physiological factors of growth, maturation and menstruation as induced by endocrine activity are responsible for some of the neutralizing substances. There is also some evidence that contact with the virus stimulates production of the neutralizing substances in man. Kramer[16] and Fairbrother and Brown[17] have placed on record actual instances in man where contact with the disease lead to the production of immune substance, while Trask and Paul[18] have made similar observations upon the abortive types of the disease. The opposite view that the abortive and nonparalytic types of the disease are a result of an adequate amount of pre-infection antibody is postulated by Eagles[19] upon serum pools from these three types of the disease used for treatment in the 1934 epidemic in Denmark, and by our titrations of serum during and after an attack (vide infra). The origin of the virus neutralizing principle in human placental extracts (McKahnn[20]) is not certain.

A peculiarity of the virus of poliomyelitis that requires some comment at this point is its weak antigenicity. While antibodies and solid im-

munity are readily produced by nasal spraying with other viruses (e.g. St. Louis Encephalitis and Louping-ill), similar experiments with susceptible monkeys do not even lead to the development of virus nentralizing substances in the blood. Subinfective or modified virus given to monkeys by the subcutaneous route seldom leads to immunity against intracerebral or intranasal infective doses, although virus neutralizing substances are produced, particularly if repeated doses of the immunizing preparation are given.[21,22] Even the vaccines, lately in use, have not yielded significant quantities of humoral antibody in the hands of all workers.[23] The underlying cause of this poor antibody response may be the lack of antigenic mass, it being well known that many viruses remain active in logarithmic dilutions (Vaccinia, herpes and St. Louis Encephalitis), while the poliomyelitis virus rapidly becomes subinfective on dilution. While other viruses develop complement fixing, precipitating and agglutinating antibodies, it has now become well established by reports from several laboratories[24,25] that the neutralizing substance is the only antibody associated with contact or infection with the poliomyelitis virus. Skin tests for susceptibilty have likewise been negative in the hands of most workers in this field.[26]

Neutralizing Antibodies During the Acute Disease and During Convalescence. It was our opinion that observations should be made upon the level of neutralizing antibody as early as possible in the acute disease of man, and again later *in the same cases* in order to determine the actual effect of an attack of the disease on the level of neutralizing substance. Antibody level should, if possible, be correlated with outcome of the disease to see if there is a level that will determine a nonparalytic or mildly paralytic form of the disease. Table 1 summarizes the results of *in vitro* neutralization tests upon the serums of 14 patients[27] during an acute attack of the disease. Only eleven serums were available for testing three to five months later. One patient,[28] an adult, was observed to have a greater than average amount of neutralizing substance even twenty-four hours before the onset of paralysis. This observation appears to be the first on record of evolution of paralysis in man in the presence of neutralizing antibody. Seven of these cases were purposely selected after convalescent serum had been administered to see what effect, if any, the administration of such low titre serums had upon the antibody level during the acute stage. The effects of passive transfer were in unmistakable evidence in only one patient (D. R.), but he had received 80 cc. of serum on two occasions only three days and one day before the first blood sample was drawn. From the fact that three months later he was entirely without neutralizing antibody suggests that none was present prior to the attack. The severity of the disease and the amount of recovery has no correlation with the level of immune substance either during the attack or during convalescence. It is quite unlikely that the high level of immune substance in patients B. W., D. B., and W. R. C. was the result of the current attack.

TABLE I

Neutralization of Virus by Serum Early in Poliomyelitis in Comparison to the Convalescent State

Patient	Age	Clinical Type	Day of Paralysis on which Blood was Taken	Ten Paralyzing Doses of Virus Neutralized by Serum in Dilution of: Initial Sample	Later Sample	Time (Months)
		No Serum or Serum Given after Blood Sample				
B. W.	9	Mild residual paresis	12th	1:100+	1:100+	5
D. B.	11	Non-paralytic	5th§	1:100+	1:100+	5
L. S.	3	Residual—one leg	9th	1:2	1:2	3
R. S.	8	Initial weakness. No residual	6th§	0	0	4
B. R.	12	Residual—one leg	7th	0	*	—
W. R. C.	45	Preparalytic. Residual paresis both arms and legs	**	1:20	1:80	3
S. S.	6	Residual, one leg	6th	1:1	1:1	4
		Convalescent Serum Given Prior to Taking Blood Sample				
D. N.	8	Initial leg paresis. Full recovery	6th	1:10	*	—
J. H.	12	Extensive residual paralysis both legs and hips	5th	1:2	1:5	6
P. J.	2	Paralysis both legs. Residual one leg	5th	1:1	0†	4
L. P.	8	Bulbar with palatal paralysis	5th	1:5	*	—
E. S.	10	Residual both legs	5th	1:1	1:2	3
M. H.	7	Residual both calves	5th	1:2	1:2	3
D. R.	14	Residual lower spine, hips and both legs	4th	1:5	0	3

*—Second blood sample not obtained.
†—1:1 failed to neutralize. 1:5 neutralized; latter probably a false positive.
§—Non-paralytic case; date on which serum was drawn was the number of days after onset of temperature.
**—Blood obtained one day before the onset of paralysis.

The series, as a whole, implies that the disease may evolve in the presence of neutralizing antibody. This is quite clear in the instance of W. R. C., from whom serum was taken a day prior to paralysis. On the other hand, patients P. J., R. S., and B. R. demonstrate very little or no antibody in the blood at any time, yet the severity of the disease and the amount of permanent motor damage is not greater than in other cases of the series.

That the amount of neutralizing substance found in the early samples is the direct effect of the current attack is minimized by the irregular appearance of immune substance following the experimental disease induced by intracerebral inoculation in monkeys. In similar tests upon monkey serums, made in parallel with the above observations upon human cases, we found neutralizing antibody not to occur until the sixth to fourteenth day after paralysis and then irregularly. No neutralizing substances were observed at any time during ten days after the onset of paralysis in 3 of 7 animals. One animal did not acquire these substances until between the third and eighth week after paralysis. Such results were independent of the test dose of virus used (3 and 10 paralyzing doses). Jungeblut has also recently reported that resistance to intracerebral reinoculation which is universal in convalescent monkeys does not depend upon humoral antibody.[29] In this connection, the experiments of Paul and Trask,[30] who showed monkeys to be susceptible to cerebral reinoculation by a recently adapted human virus when convalescent from an attack conferred by a passage strain and the converse should be recalled.

Significance of Neutralizing Antibodies in Serum Therapy. Evaluation of observations upon the effect of convalescent serum treatment of the disease are fraught with difficulty, since the severity and types of the acute disease vary from epidemic to epidemic and even in the same epidemic. Statistical analysis of certain large epidemics has failed to elicit favor for convalescent human serum except that the earlier the serum is used in the acute stage, the less is the incidence of either acute or residual paralysis. Clinical observations that have been made of a rapid response to the administration of serum, of a rapid response by a drop in temperature and improvement in symptoms cannot be disregarded. It is questionable if treatment of one group of cases with serum, withholding it from others has been justifiable from either the administrative or scientific point of view.

Experimental monkeys cannot be used to evaluate a serum to be applied in the human disease, since for reasons as yet poorly understood the disease of these animals is fulminating. The endemic types of the human disease are especially unlike the experimental counterpart, the former having a smoldering and often nonparalytic course. Even in epidemics reported before 1933, from 70 to 80% of cases were nonparalytic types. In certain recent epidemics in Denmark and in southern California less than 10% have been paralyzed at any time. It is entirely probable that preparalytic cases are seen in this stage because they are mild cases. For example, the general mortality in the epidemic of 1931 in New York City was 12.2%, while among the preparalytic cases that received no serum the mortality rate was only 0.9%.

Reference should not be omitted to the results of treatment with convalescent human serum to be found in recent reports. Tebbutt and Helms[31] observed a lower mortality in the cases treated in the preparalytic stage of 3.3%, as contrasted to 11.8% in the untreated controls seen after paralysis was present. Again in this report there was evidence that the preparalytic cases presented milder paralysis and a longer preparalytic period. Jensen[32] thought that the earlier after the onset of symptoms that treatment was applied, the less the incidence of paralysis. If applied three days or more after the onset of symptoms in the preparalytic period, there was little difference in the percentage developing paralysis. Cowie and his co-workers[33] have reported no residual paralysis in 80 preparalytic cases treated with both human convalescent serum and transfusions from normal adults. There was but one paralytic case observed in this series; this rapidly cleared. Symptomatic improvement was noted even in certain paralytic cases Lastly, Levinson[34] has treated 149 preparalytic cases of the seasonal endemic type of poliomyelitis in Chicago during the past four years. He states that the incidence of paralysis has been negligible and most of the temporary weakness disappeared later. He, too, has been impressed by the amelioration of symptoms in both the preparalytic group and in the paralytic cases with smoldering fever or acute recrudescence.

As specific treatment is continued during the next few years, the efficacy of *concentrates from antiviral animal serums* having advanced neutralizing potency should be evaluated. Titrations of pools of convalescent serums show only a moderate amount of neutralizing antibody. It is possible that tested human convalescent serum or normal human serum of high antibody content would be more effective in practice. Another source of antipoliomyelitis neutralizing substance that may be available for human therapy is human placental extracts (McKahnn[20]). We have recently determined that these preparations contain more neutralizing antibody than the average of convalescent serum pools.

SUMMARY

Since poliomyelitis semes to be an exclusive disease of the nasopharynx and nervous system in man, the irregular extraneural migration of virus is thought to explain the irregularity of production of neutralizing antibody. Infection can be blocked by peripheral nerve section or by section of the olfactory tracts. Chemical blockage of infection at the nasopharyngeal portal of entry appears to have been demonstrated recently. This later method may have some value in prophylaxis of the human disease.

The specific virus neutralizing substance in poliomyelitis is unique in that a greater number of adults without history of contact or infection possess these substances than convalescents from the disease. The average concentration of immune substance in normal adults is equal to or greater than that carried by convalescents. The importance of an actual attack of poliomyelitis in the production of these substances is minimized by our serological studies.

Convalescent and other specific serum therapy should be continued, as there is no evidence that it is not of value. On the other hand, symptomatic improvement following serum administration is almost universal. There are indications that preparalytic poliomyelitis in man is a naturally milder type of the disease than the cases seen after paralysis is present. At the present time specific vaccination is considered to be too dangerous to be applied to man without careful supervision in a controlled study in non-epidemic months.

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28. For the samples of blood from the preparalytic case we are indebted to Dr. M. A. Gifford of Bakersfield, Calif.

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DISCUSSION

Dr. H. J. Shaughnessy, Springfield: I think Dr. Harmon should be congratulated for his very able and very analytical discussion of a very controversial field of investigation. His own findings are extremely interesting, even though most of us who have had anything to do with this field find it very difficult to harmonize them with the orthodox views on the subject.

The essayist and I have discussed many points along this line and I think he will pardon me if I bring up certain points which I think bear on his discussion. In the first place, I think it should be remembered that there is a possibility that the pathogenesis of the disease in man and in monkey may be somewhat different. All of the experimental work reported by the essayist has been done, of course, on monkeys. In the disease poliomyelitis in monkeys, we are dealing primarily with a neurotropic strain which has been adapted to the monkey by repeated transfers into the cerebrum. Therefore, the virus of poliomyelitis possibly behaves in a different manner in the monkey than the human virus in man. We have a similar basis for this view in the case of the yellow fever virus, which is primarily a visceral virus but which can be adapted, by repeated intracerebral transfers, so that it becomes neurotropic and when it does become neurotropic its reactions in the animal are quite different from the normal strain. That might explain some of the results which have been obtained by the essayist.

In the second place, the neutralization tests reported here were made with monkey passage strains of virus. Of course, practically all such studies have been made with passage strains because it is very difficult to obtain human strains and work with them. By human strains, I mean those which have been just isolated from the human host and have been transferred only through a very small number of generations. There is some evidence in the work of Paul and Trask that monkey passage virus acts more broadly in its reactions towards sera in general. For example, in their work they found that, when they conducted neutralization tests with monkey virus, there seemed to be a correlation between the age of the person from whom the serum was taken and the neutralization test, whereas, when they used a human strain in the neutralization experiments, there was a better correlation between the condition of the patient, that is whether the patient had previously had poliomyelitis or had been exposed to the disease, and the ability of his serum to neutralize virus. It is unfortunate that we cannot use the human strain to make studies such as this one that Dr. Harmon has just reported. The results might be somewhat different. They might be more in accord with some of our views.

In discussing the question of the significance of these neutralizing substances, I think we should not lose sight of the fact that there are a great many parallels between the possession of these substances and our general ideas concerning whether the persons or monkeys tested are immune or not. In the case of the monkey these substances appear in the blood only after an attack of the disease or after injections of vaccines. Of course, we all grant that vaccination may not produce solid immunity in the monkey. In that respect, then, the possession of these neutralizing substances does not necessarily mean immunity in that sense of the term. Then we know that there is a passive transfer of these substances from the mother to the infant. There is the general correlation between age and the possession of these substances, and the corresponding parallel between age and immunity to the disease or lack of immunity. And finally, the fact that in rural areas, insofar as the meager data available show, these substances are not acquired as rapidly as they are in urban areas where contact with the virus is probably more widespread.

I think that Dr. Harmon has brought this point out very well: that neutralizing tests have been considered too seriously in the past as being an index of immunity. On the other hand, I think we ought to be very careful not to discard this type of evidence entirely until

we are sure that the possession or absence of these substances does not indicate a certain amount of immunity. Craigie has discussed this problem very thoroughly in a recent issue of the *Canadian Journal of Public Health* and has tried to reconcile, as Dr. Harmon did today, the general ideas of humoral and tissue immunity. He pointed out, from his experiments, that tissue immunity to poliomyelitis apparently does not exist in the monkey. He, therefore, indicates that we must fall back on the humoral theory of immunity or else we have no theory to account for resistance to poliomyelitis.

Dr. Harmon, in closing: There may be a reason why the experimental disease in monkeys is fulminating with a paraplegia involving all extremities, the trunk and neck, with rapid death. The difference may lie in the fact that human poliomyelitis, which is essentially a non-paralytic disease with low fatality, may be conditioned by the presence of these neutralizing substances. Experimental monkeys do not have them unless by artificial contact with the virus. If we extend these observations which we hope to do and I hope others will do, to a large number of cases, it may be that some correlation may be established between the severity of the disease itself and the content of neutralizing substances in the blood.

Dr. Shaughnessy mentioned something about the strains of virus. It is well established that there are human strains and monkey strains. In fact, every one that has tried to pass on the nasopharyngeal virus from man to monkey or tried to adapt the virus from the human cord to the monkey has found that difficult to do. Last summer we thought for a while that we had isolated a non-paralytic virus. We passed it through three successive generations in monkeys but finally lost it. Virus adapted to monkeys from humans, in general, produces very little or no paralysis, so that that may be another reason why human poliomyelitis is unlike monkey poliomyelitis: the characteristic virulence of the particular strain.

There is no other virus disease which, so far as I know, has neutralizing substances in as wide-spread a group of the population as there is against the poliomyelitis virus, except herpes virus and the influenza virus. There is known contact in the instance of those particular viruses, whereas in the case of the poliomyelitis virus such contact is somewhat hypothetical.

Tissue immunity is something to be arrived at indirectly in this disease. So far as I know, there is no direct evidence for the presence of tissue immunity in poliomyelitis. If one could find a measure of this tissue immunity perhaps we would be in a better position to determine some more effective method of vaccination against anterior poliomyelitis.

I should also mention at this time that due to the peculiar pathogenesis of the disease, it is possible now, at least experimentally, to block infection at the nasopharyngeal mucosa. Several chemicals have been found recently, picric acid, mercurochrome, etc., which if dropped into the nares will block infection in experimental animals in about 70 or 80% of cases. Whether this will be directly applicable to the human disease is something to be determined in the future.

A FIVE YEAR REVIEW OF ANTERIOR POLIOMYELITIS IN THE CHICAGO AREA.

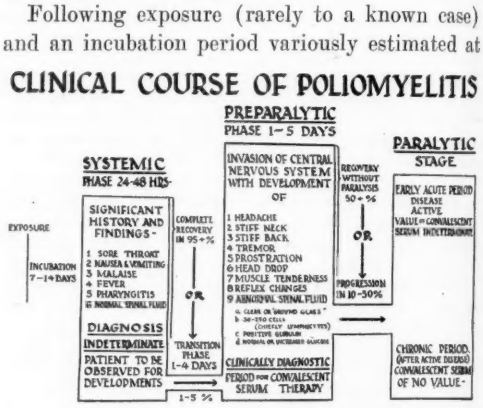
SIDNEY O. LEVINSON, M. D.

CHICAGO

After five years of observation of acute anterior poliomyelitis in the Chicago area, it is felt that a study of the results might bring out some facts which would be of significance both from the clinical and the therapeutic standpoint.

Despite some isolated reports to the contrary elsewhere, the disease has followed very characteristically the course that has previously been described for this infection. The progress of illness in most cases has shown three fairly distinct phases. (Chart No. 1).

Following exposure (rarely to a known case) and an incubation period variously estimated at



one to three weeks, the first stage appears as a general systemic illness of one or two days' duration, simulating an upper respiratory or minor gastrointestinal ailment. It is characterized by fever of 101°-102°, sore throat, mild headache, and, at times, nausea and vomiting. Examination discloses little besides a mildly injected throat, some fever and a slight cervical lymphadenopathy. It has repeatedly been observed that at this time a spinal puncture discloses a normal spinal fluid. It is immediately apparent that at this time and with these findings no one can justifiably make a diagnosis of poliomyelitis. However, it should be added that during the summer or fall months, even in the absence of an epidemic, but particularly so when there is an epidemic, such a minor ailment should not

From the Samuel Deutsch Serum Center, Michael Reese Hospital, Chicago. Read before section on Public Health and Hygiene, Illinois State Medical Society, Springfield, May 19, 1936.

be dismissed without a second thought. Well over 90% of patients recover completely from such minor ailments, which may have no connection with a poliomyelitic infection.

The significance of this first stage is interesting. Almost all patients developing recognizable infantile paralysis give this history of systemic illness. Kramer has shown that the majority of city bred adults are apparently immune to poliomyelitis, although giving no history or evidence of the disease. He has also shown that some individuals have developed an immunity as a result of exposure to the disease, even though they showed no symptoms of infection, or only the indefinite manifestations of the first stage. Trask and Blake were able to demonstrate the presence of virus in contacts who themselves were only mildly ill. Consequently, it is felt that poliomyelitis is far more generalized than was once believed, but that in over 90% of cases, the infection is minimal in severity, sufficient only to produce a minor ailment with some subsequent immunity.

In those cases that do not recover, the second or preparalytic stage follows immediately after the initial illness. Very often there is an interlude, a latent period of one or more days during which the patient apparently is well, before the disease resumes its course. This is known as the "dromedary" form of invasion, and observation should be maintained of the clinically recovered patient for signs of reappearance of the infection. In contrast with the first stage, this second stage is characterized by symptoms and signs indicative of involvement of the central nervous system. The duration of this period is one to four days, although it may be prolonged. There is fever of 101°-102°, headache of varying severity, irritability, restlessness, apprehensiveness, hyperesthesia, pains in the neck, back and muscles. The patient is usually prostrated. The face is flushed, and there is present a circumoral pallor. The *tache cerebrale* is quite distinct. The pharynx is very often mildly injected and cervical lymphadenopathy is found. The neck and back are resistant to anterior flexion, and attempt to do this produces pain. A head drop is very common. A positive Kernig is frequent, the Brudzinski less common. Tremor of the extremities and muscle tenderness may be present. The muscle power at this stage is normal, but the reflexes, which early are normal, later are changed, and these changes are highly significant. Loss of the superficial abdominal and cremasteric reflexes are observed early. The deep tendon reflexes, which early may be exaggerated, become diminished and then absent. Such changes in the reflexes, or inequality of corresponding reflexes are very indicative.

It cannot be expected that a case will demonstrate all the signs enumerated. In most instances, however, there will be enough findings so that the physician, on the alert for this disease, will have grounds to suspect its presence. With a history of a mild general illness becoming more severe, progressing, with or without interruption, to a clinical picture such as outlined, and pointing to invasion of the central nervous system, a presumptive diagnosis of acute anterior poliomyelitis can be made. At this stage a spinal puncture should be done and can be expected to confirm the diagnosis. The characteristic spinal fluid is under somewhat increased pressure, clear or "ground glass" in appearance and contains usually 50 to 250 cells. The majority of the cells are mononuclears, but early in the disease there may be a predominance of polynuclears. At times the cell count may be over 1000, while, on the other hand, a number of cases have been observed in which the cell count was normal. The globulin is positive, and sugar normal or slightly increased.

There are certain infections where one will obtain a history, physical and neurological signs, and even occasionally positive spinal fluid findings that resemble this preparalytic stage of anterior poliomyelitis.

In Chart No. 2 are enumerated a total of 65 cases seen in the last two years as suspect cases of poliomyelitis, but in which some condition other than poliomyelitis could be definitely established. These cases presented a clinical picture which led the attending physicians to consider the likelihood of poliomyelitis. Several features are brought out by this chart. The condition most often suspected of poliomyelitis is that of acute encephalitis. There are a large variety of conditions which will give a history or disclose findings suggestive of anterior poliomyelitis, but they can be differentiated by painstaking examination and spinal puncture. The same list of conditions shown in the chart comprises the majority of initial diagnoses made in

those cases that terminate in paralysis; that is, paralytic poliomyelitis before the onset of paralysis is often diagnosed as encephalitis, acute pharyngitis, acute upper respiratory infection, acute rheumatic fever, etc. Little or no thought is given to the diagnosis of poliomyelitis until paralysis supervenes. As can be seen from the chart, in almost all instances, it is no grave mistake to suspect poliomyelitis in the conditions enumerated. The consequences are much more grave, however, when poliomyelitis is overlooked. If the condition sufficiently resembles that of early infantile paralysis and another diagnosis cannot be definitely proved, the patient's illness must be considered and treated as a probable poliomyelitis until the diagnosis is clear.

Until the last two years, all cases that were seen in the preparalytic stage were treated with convalescent serum, administered both intraspinally and intravenously in a minimum total dosage of 80 cc. Although one injection of serum was usually adequate, occasionally a second dose was required. It was found that those patients who required a second administration were usually adolescents, adults, or encephalo-bulbar types. In the last two years, therefore, the dose has been increased, and at the present time our initial minimum dose is 100 cc. in children, and 200 cc. in adolescents, adults, or superior forms of the disease at any age. Patients who are clinically and symptomatically in the preparalytic stage of poliomyelitis, but whose spinal fluid shows no increase in cell count, receive the entire dose of serum, only by the intravenous route.

The preparalytic serum treated series at the present time comprises 149 cases. (Chart 3.) Of this number, 92 showed no evidence of muscle weakness. Forty-one developed a temporary weakness, which cleared up completely within three weeks. Ten cases showed a mild residual weakness, usually of only one muscle group. This degree of weakness was so mild that it could be discovered only by careful muscle examination. Four patients developed a moderate permanent paralysis, none of them of severe degree, and in three of them sufficiently mild that their activities are in no way impaired by the paralysis.

No estimate can be made of incidence or severity of paralysis that would occur unless an alternate case control group is studied. No comprehensive, alternate case, well controlled study has been made. Mortality rate and degree of paralysis in untreated cases indicates that the endemic disease in the Chicago area is not mild. The development of only moderate paresis in four of 149 treated preparalytic patients is far less than can be expected even in an outbreak of mild poliomyelitis. It is felt that this relatively insignificant rate of paralytic involvement can be attributed only to specific, early, adequate therapy.

If the serum is of value in the treatment of the disease, then it cannot be withheld from any patient who is acutely ill, even though already paralyzed. No benefit can be expected from the use of serum upon the already existing paralysis, but because the disease does not always terminate with the initial paralysis that appears, it is felt that these patients still acutely sick must be given convalescent serum for its possible effect in checking the advance of the disease process. The records from patients treated in the early acute paralytic stage suggest that clinically the disease in most instances seems to have been arrested. However, it is a matter of conjecture and purely one of personal opinion whether the process would not have subsided spontaneously.

The mortality rate in the encephalobulbar patients, who were still acutely sick when first seen and consequently treated with serum, may be of significance. (Chart 4.) It is seen in this group of 50 patients that there was a mortality of 42%. This is a relatively low figure, because experience teaches that superior poliomyelitis is the most fulminating and virulent type and attended by a mortality varying from 60 to 80%.

Since this is human serum that is being administered, the danger of any reaction is almost insignificant. The serum must be warmed to body temperature in a warm water bath, and must be injected slowly. If these precautions are observed, no severe reactions need be expected. There may be some increase in nuchal and spinal rigidity, and a temporary rise of one or two degrees in temperature, but this effect is transient.

The patient is carefully observed, and, if there is evidence that the disease process has not been arrested, a second dose of serum is administered

intravenously. The criteria for determining cessation of active disease are diminution in fever, improvement in the general appearance and degree of prostration, and evidence obtained by another careful muscle and nerve examination that no advance in motor nerve cell damage has occurred.

The general treatment of this disease in the preparalytic stage is like that of any acute infection. In addition, however, orthopedic measures must be instituted promptly. The muscles must be placed in position of physiologic rest. The bed should be firm, the feet kept at right angles, the knees very slightly flexed, the arms in abduction. Very gentle examination may be made periodically to determine the appearance of any weakness so that proper position may be instituted. It has been frequently observed that even a mild paresis of a certain group of muscles may develop. This in itself need cause little concern, because with proper physiotherapy later, it will completely disappear. But during the period that the patient is confined to bed, if these paretic muscles are not properly supported, the antagonist muscles will develop shortening—the paretic muscles will be lengthened and further weakened, and the final effect will be far worse than should be anticipated if the proper steps are taken for rest and support of the involved muscles.

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DISCUSSION

Dr. Julius H. Hess, Chicago: During the past two years many statistical studies on serum therapy of poliomyelitis have been published. After reading these various reports based on accumulated studies of various observers, there arises much difficulty in one's mind in coming to a conclusion as to whether human convalescent serum is of great value. It is a well known fact that the same group of statistics allow of widely different interpretation. In only too many of the reports there has been little citation of results in individual cases or special types and groups of cases. I will, therefore, base my remarks on my personal observations.

Dr. Levinson spoke of the pre-paralytic cases in his group. I have had occasion to see a number of the cases cited in this study and am quite convinced of the good results attributed to the use of convalescent serum therapy in such cases. I wish now to speak of the child who has a more or less extensive paralysis at the time of treatment. We all know that when nerve cells are once destroyed we cannot replace them. The question to be answered in this form of therapy is how much can we accomplish through neutralization of the toxins by the administration of human convalescent serum after evidence of paralysis is present. During the last year I have treated all cases by giving large doses of serum intravenously, avoiding intra-spinal administration. In coming to a final conclusion as to what we would recommend in practice, it can best be answered by, "What would I do if my own child had infantile paralysis?" Personally, I would administer human convalescent serum intravenously in large amounts. I wish to review three cases that come to my mind as I have been sitting here listening to the last two papers.

The first child, a boy of 14 years, attended Mass on Sunday morning. He stated that he was not feeling well early in the morning, but his folks insisted upon his going to church. Kneeling at Mass he was unable to rise. They assisted him out of the Church and carried him home. This was about noon. The family being in very poor circumstances, did not send for a Doctor until one o'clock on Monday. About 1:30 his physician called me up and told me that he had a case of bulbar polio. I saw the boy at 5 o'clock. When we arrived we found him lying in bed with all four extremities, chest, and abdominal muscles involved. Saliva was running from his mouth and his respirations were short and shallow. It appeared as though he were drowning in his own saliva. I believe Dr. Hoyne will recall this boy. We called the Municipal Contagious Disease Hospital and asked them if they had serum on hand. They answered, "Yes." Upon arrival he was given 60 c.c. intravenously and this was repeated the next morning and a third dose was given, I believe, some 12 hours later. At the end of the quarantine period he was discharged from the hospital. I have seen him since and other than for some muscular weakness, he has made a good recovery.

The second case occurred in a small village near Chicago. I was called by Dr. William Doepp, who had seen the child in consultation with the family physician. The family physician had seen the child three days previously with an upper respiratory tract infection. Being ill himself, he did not see the child again until the fourth day, when he called Dr. Doepp in consultation. By the time the boy reached the hospital, all four extremities were involved and there was a complete absence of abdominal reflexes. This was about two months ago. He came into my office about a week ago and said, "You may not remember me. I am the fellow who was sick with infantile paralysis." He received 300 c.c. of serum intravenously in the course of 36 hours.

The third case gave a history of having been sick eight days and was one of the Landry-ascending type with first an involvement of one leg, then the other, followed by a paralysis of the abdominal and chest muscles and the upper extremities. He had been in and out of the Drinker respirator three or more times that day. He was given 100 c.c. that night and another 100 c.c. the next day and later a third 100 c.c., intravenously. He has since made what appears to be practically a complete recovery. There was some question as to whether this was a case of polio-neuritis type. This sums up pretty much what I think of human convalescent serum. I do not want to leave the impression that serum will restore damaged cells, but I do believe

neutralization of the toxins will save many cells involved but not beyond repair.

I wish to leave the thought with you that we haven't anything better than large doses of serum at present and that when given intravenously as soon as the diagnosis is made or even suspected, many cases will show improvement and in some instances complete recovery.

Dr. Arthur F. Abt, Chicago: I have nothing to add, but I would like to ask a few questions about poliomyelitis.

I notice that in the preparalytic cases Dr. Levinson pointed out there is an increase in globulin and also an increase in the cells. If I remember correctly, Amoss in the New York epidemic in 1916 pointed out that the rise in globulin often preceded by twenty-four hours an increase in the spinal fluid cell count. I thought perhaps Dr. Levinson could tell us more about that. If we have a case of poliomyelitis and only have a globulin rise, we might have to wait twenty-four hours before we get a cell increase.

Then there is the point about differentiating between poliomyelitis and encephalitis. It seems to me clinically that this is often a very difficult procedure. Phillip Rothman, of Los Angeles, several years ago wrote a paper in which he tried to point out that encephalitis was entirely distinct from poliomyelitis. I still believe that it is possible to have poliomyelo-encephalitis. I would like a little discussion on that point.

Nor can we pass this subject without some discussion as to the portal of entry. Coming from Kansas City, I heard a doctor from Cleveland give a wonderful paper on the gastro-intestinal portal of entry. I would not like to see the discussion closed, leaving the impression that the only portal of entry is through the nasal passages.

In support of the intestinal portal of entry, I would like to point out Ayers' work some years ago in an epidemic involving a milk route. There is also an old and ancient work, of which I know, of an early German doctor who followed an epidemic of poliomyelitis on the banks of a river in Germany. It was only the people who drank water from that river who became infected with poliomyelitis.

Then, as a last point, I would like to know about the contagiousness of poliomyelitis. A physician has reported that he himself contracted poliomyelitis and that his children and wife also became ill with the disease. On the other hand, I know of instances where children in the same family slept in the same bed, the one child having the disease in active form and the other child never contracting the illness from his bedmate.

Dr. Levinson, in closing: I have nothing to add to Dr. Hess' discussion, except that our experience in the treatment of paralyzed cases parallels his own. The results of serum treatment in paralyzed cases can only be based on a clinical impression and not on any statistical analysis.

Dr. Abt brought out one fact, which gave me a great deal of concern in 1931. The globulin rise does precede the cellular rise in the spinal fluid. At times there may even be a definite case without any cellular increase, and complete reliance on the laboratory findings of a cellular increase in the spinal fluid may cause us to overlook and miss a frank case of the disease.

I recall five cases that developed unquestionable poliomyelitis, with no increase in the spinal fluid cell count. So, I think Dr. Abt's point is well taken, that if history and clinical findings point to poliomyelitis, even a normal spinal fluid should not prevent you from considering and treating the case of poliomyelitis.

I find it most difficult to differentiate encephalitis from poliencephalitis. Frankly, when seeing a case in which the immediate differential diagnosis cannot be made, in view of the fact that we have no real therapy for encephalitis, I feel that the patient is entitled to receive serum, because frequently these cases of encephalitis are poliencephalitis. The only harm is the loss of some serum. If the diagnosis is eventually proven wrong, the case is excluded from the series, but no wrong has been done to the patient.

Because the onset of the disease is very frequently a gastrointestinal disturbance, we are not convinced that the only route of entry of the virus is through the nasal passages. All experimental work points to this route, but clinically we cannot yet accept it. It seems logical to expect that, if the virus always entered through the nasal mucosa, in its passage down the spinal column the nerve cells would become progressively affected and a descending paralysis manifested. However, in man the most frequent paralysis occurs in the lower extremities and frequently involves only the lower extremities. Since transmission of the disease has been linked at times with milk and water, it would seem unwise to ignore other routes of entry.

For practical purposes, we may consider the contagiousness of this disease extremely low. It seems to be infectious and widespread, but there are relatively few multiple cases and very few contact cases.

I hoped that someone would discuss the chief evidence against serum therapy. There is not time to discuss the evidence for or against serum from the experimental disease. The clinical argument against serum is based chiefly on Dr. Park's widely known and influential study, which showed that the non-serum treated cases fared as well as the serum treated cases.

I wish to read a comment on the cases composing this study from the New York Academy of Medicine Bulletin. Because this publication is chiefly local, the expression of opinion to be quoted has not had the effect or influence it merits. It appeared in October, 1932, one month following Park's publication:

"Are the treated and untreated groups comparable? In an endeavor to ascertain whether or not the untreated group was a milder group than the treated group, each physician was asked to classify his patients as mild, fairly ill, seriously ill and extremely ill. A statistical analysis of the data based on this grading showed that the untreated group was indeed a much milder group than the treated group. There were also differences in age distribution and other factors which might have influenced the end results."

In consideration of this statement, and the conclusion that the results of the study are inconclusive, and that the members of the committee feel that more accurate and more intensive work should be done along

this line, I think that condemnation of convalescent serum therapy is unjustified. This condemnation was based upon a study wherein the control group consisted of neither alternate nor comparable cases. The obligation rests with those who deny the value of convalescent serum to perform a carefully controlled alternate case study to validate their contention. We, who believe in the value of convalescent serum therapy, cannot assume the responsibility of denying such therapy to any patient.

SUSPECT POLIOMYELITIS—1934-35
65 CASES

Diseases	No. Cases	Diseases	No. Cases
Encephalitis	15	Diffuse Myelitis	1
Acute Pharyngitis	7	Post Measles Arthritis	1
T. B. Meningitis	6	Heat Prostration	1
Acute Upper Respiratory Infection	6	Post Scarlatinal Nephritic Uremia	1
Peripheral Polyneuritis	6	Tetanus	1
Acute Entero Colitis	4	Septicemia	1
Epidemic Meningitis	4	Acute Sinusitis	1
Pneumonia with Toxic Encephalitis	3	Osteomyelitis	1
Acute Rheumatic Fever	2	Luetic Meningo Myelitis	1
Post Diphtheritic Paralysis	1	Vaccinial Encephalitis	1
		Diabetic Coma	1

ACUTE ENCEPHALO—BULBAR—POLIOMYELITIS
TREATED WITH CONVALESCENT SERUM

Hours	Recovered Number	Died Number	Mortality Percent
0-24	4	3	43
24-48	17	10	38
48-72	6	6	50
72+	2	2	50
Total	29	21	42

PREPARALYTIC PATIENTS TREATED WITH
CONVALESCENT SERUM

Course	Total Number	Percent
No Paralysis	92	61.8
Temporary Paralysis	41	27.5
Permanent Paralysis—Mild	10	6.7
Permanent Paralysis—Moderate	4	2.6
Permanent Paralysis—Severe	0	0.0
Died	2*	1.4
Total	149	100.0

*One other patient died of a pneumonia complicating a convalescent nonparalytic poliomyelitis.

FEVER THERAPY OF MYCOSIS FUNGOIDES

Joseph V. Klauder, Philadelphia (*Journal A. M. A.*, Jan. 18, 1936), presents data from which it appears that an acute infection favorably influences the course of mycosis fungoides. Of five cases of this disease treated with inoculation malaria, here reviewed, the results were favorable in four. Malarial therapy apparently does not cure mycosis fungoides; it produces, however, a distinct effect on the disease, an effect greater than treatment ordinarily employed, such as arsenic and roentgen therapy. The future therapy of the disease may be the employment of all these methods. Observations are too incomplete to evaluate the therapeutic efficacy of fever produced by electrical methods. From the evidence presented it appears that fever caused by an infection is superior. If the electrical method of producing fever is employed it would seem more desirable to combine such therapy with the injections of nonspecific proteins, notably vaccines intravenously, in order more closely to simulate the changes that are caused by a systemic infection. Reference is made to the stimulation of the reticulo-endothelial system by injections of antigenic substances and the role that such a system plays in the defensive mechanism of the body. The concomitant injections of antigentic substances with fever therapy are in accordance with the hypothesis of Jacobsen that the reticulo-endothelial system, when sufficiently active (as when stimulated by one or a number of acute infectious processes), may attain in a measure the ability to cope with neoplastic diseases in a similar if not an identical manner. Malarial inoculation or fever therapy should be given consideration in treatment of other diseases constituting the lymphoblastomas.

RELATIVE GREATNESS

A Boston teacher asked her class to name the twelve greatest men in the world. One boy wrote:

The Harvard football team	11
Babe Ruth	1
	12

Marriages

CLARK E. BAKER to Miss Polly Heaton, both of Marion, Ill., in Beaumont, Texas, May 12.

JOHN PHILIP GRAHAM, Galesburg, Ill., to Miss Eleanor Hegy of San Jose, Calif., in New York, June 13.

HAROLD SHELLOW to Miss Vivian Inez Van Ronkel, both of Chicago, July 8.

Personals

Dr. William Allen Pusey was recently elected an honorary member of the Austrian Dermatologic Society.

Dr. Lawrence F. Isenhart has been named health officer of Mount Carroll, succeeding Dr. Samuel P. Colehour.

Dr. George J. Musgrave, Chicago, discussed "Nasal Accessory Sinuses" before the Christian County Medical Society, July 23.

Dr. Kenneth G. Bulley of the staff of the Wisconsin State Sanatorium, Statesan, Wis., has been named superintendent of Kane County Springbrook Sanatorium, Aurora.

Dr. M. Herbert Barker, Chicago, addressed the Whiteside County Medical Society, June 25, on "Treatment of Hypertension with Special Reference to the Cyanates."

At a meeting of the McLean County Medical Society in Bloomington, June 9, Dr. Archibald L. Hoyne, Chicago, discussed "Treatment of Meningococcic Meningitis."

Dr. Paul A. O'Leary, Rochester, Minn., discussed "Modern Treatment of Syphilis" before the Peoria City Medical Society, June 23.

Newly elected officers of the Chicago Society of Internal Medicine are Drs. Walter L. Palmer, president; Andrew C. Ivy, vice-president and Clarence F. G. Brown, secretary.

At a recent meeting of the Chicago Urological Society, the following officers were chosen: Drs. Harvey A. Berkey, president; William J. Baker, vice-president, and Colquitt Otis Ritch, secretary.

Dr. Percival Bailey, professor of surgery and neurology, School of Medicine, Division of Biological Sciences, University of Chicago, gave a lecture in Carmi, July 2, on the history of the Armenian village Zeitouri in Asia Minor.

Dr. Frank S. Needham, Oak Park, won the VanDerslice Cup at the annual golf tournament of the Chicago Medical Society August 12 at Olympia Fields with a gross score of 85. First prize for low net score for officers and councilors went to Dr. Richard F. Greening; for branch presidents and secretaries, Dr. Anders J. Weigen. First low gross score for members was made by Dr. John P. Mulcahy; first low net by Dr. Guy V. Pontius; first high gross by Dr. John J. Gill. About 250 physicians and their friends participated in the tournament.

News Notes

—The quarterly meeting of The Illinois Radiological Society was held in Bloomington, at the Hotel Rogers on Sunday, July 26.

At a film clinic interesting cases were presented by Drs. Halley, Rypins, and Henley.

Dr. P. G. Melnick and Albert Bachum discussed the "Time Factor in the Irradiation of Malignant Tumors" and Dr. A. H. Arneson presented a paper on "Radiation Therapy in the Treatment of Malignant Diseases."

—A special program of lectures and demonstrations in medicine and surgery will be held under the direction of the Mayo Foundation from November 9 to 13, inclusive. Mornings will be devoted to surgical and medical clinics. In the afternoons and evenings symposiums will be conducted on neurology, gynecology, diseases of the ear, nose and throat, laboratory procedures, emergency treatment, pediatrics, and renal diseases. In addition a clinico-pathologic conference will be held. While this program is arranged primarily for the Fellows of the Foundation, visiting physicians are invited to attend.

—The Illinois Society for the Prevention of Blindness conducted an institute, for public health nurses engaged in school work, on the last day of August and the first three days in September, in the Medical and Dental Arts Building, Chicago.

Lectures were given by Drs. Dewey Katz, Richard C. Gamble, Philip Halper, Thomas D. Allen, and George P. Guibor, Miss Myrtle Chalstrom, Mrs. Marjora Garrity of the Board of Education, and Miss Audrey M. Hayden, Director of the Illinois Society for the Prevention of Blindness.

—POSITION AVAILABLE: A fairly remunerative position is available for a statistician capable of some scientific editorial work. Physician preferred. Give qualifications I. M., care of ILLINOIS MEDICAL JOURNAL.

—According to *The Illinois Health Messenger:*

Two cases of Rocky Mountain spotted fever, rare in this area, were discovered in Illinois early in June. One was at Clinton and the other on a farm near Canton. Tests made on blood specimens submitted for examination to the diagnostic laboratories of the State Department of Public Health led to a correct diagnosis in both cases. One patient was a filling station attendant and the other a stock raiser's wife. Both were seriously ill.

The appearance of this disease in Illinois emphasizes the growing importance of modern transportation in the spread of communicable diseases. Faster trains, better highways, high-powered motor vehicles and airplanes make it easier and easier for infected people, animals and insects to be transported great distances.

Rocky Mountain spotted fever, a first cousin of typhus fever, was formerly confined almost exclusively to the cattle raising area of the Rocky Mountains, particularly the Bitter Root Valley of Montana. It is spread to humans from cattle

through the bite of wood ticks and perhaps other insects. It is frequently fatal. During recent years the disease has tended to spread. From 400 to 500 cases with from 75 to 100 deaths are reported annually in the United States. So far the greatest incidence has occurred in the Mountain, Pacific and South Atlantic states. A sprinkling of cases has appeared persistently during recent years in morbidity reports from the Middle West, especially in Iowa and South Dakota.

—The Sangamon County Medical Society held its annual picnic at the Wentworth Club and golf tournament at the Oakcrest Country Club, July 23.

—The University of Illinois this autumn will inaugurate a study of the causes of traffic accidents and the efficacy of methods to reduce the motor toll, the Chicago *Tribune* reports. Students will be required to pass a driver's license examination to obtain a school permit to use an automobile and the cars will have to pass a mechanical test. A detailed record will be kept of all available pertinent information on the 500 automobiles for which student permits are issued. It is hoped to gain information of value to street safety engineers.

—A division of industrial hygiene in the state department of health, Springfield, has been created to study health hazards under which employees work and make recommendations for preventive measures. Headquarters for the new division will be at the University of Illinois College of Medicine, Chicago, with Dr. Milton H. Kronenberg in charge.

—The state health department needs convalescent blood serum to replenish the supply on hand for the treatment of new patients with infantile paralysis. Healthy persons in Springfield and vicinity who have recovered from infantile paralysis during the last ten years and who wish to contribute blood for this purpose will be compensated. Additional information may be obtained from the state health department at Springfield.

—A movement was launched to place antirabic serum on the list of free medicines furnished by Cook County, the Chicago *Tribune* reported July 25, as a step in the campaign now being waged against the disease by officials in Chicago and the county. A special campaign will be carried on against unmuzzled dogs with the adoption of an emergency ordinance permitting the destruction of any dog not claimed within twenty-four hours and a quarantine has been imposed forbidding the transportation of dogs into or out of Cook County. The *Tribune* reported, July 27, that 242 cases of dog bites had been reported within the previous two and one-half days.

—A new two-story building to house the trachoma clinic in Jonesboro was dedicated, July 15, under the auspices of the Union County Board. Speakers included Miss Audrey Hayden, secretary of the Illinois Society for Prevention of Blindness. The building was constructed with materials salvaged from abandoned county buildings; it was financed with WPA funds. Opened in 1934 in the Union County courthouse, the clinic is one of several in southern Illinois where trachoma is prevalent. More than 1,700 positive trachoma patients and 350 suspects attend the five southern clinics, which operate three days each week in Herrin, Harrisburg, Shawneetown, Vienna and Jonesboro, newspapers reported.

—A program of expansion is under way at the Elgin State Hospital, Elgin, which ultimately will involve the expenditure of $14,000,000 in addition to $3,000,000 which has already been appropriated from PWA funds. Plans have been approved for a diagnostic center, with a maximum of 200 beds; a tuberculosis pavilion, with 100 beds; infirmaries for male and female patients; a cottage for male patients; a two-story apartment building to house members of the medical staff and their families, interns and residents, and a two-story building for employees, with separate quarters for registered nurses and space for classroom and recreational activities. In the last five years the patient population at Elgin State Hospital has increased from 3,466 to 4,600. During the latter part of 1935, more than 600 patients were transferred to the Manteno State Hospital, Manteno, where a building expansion program has also been under way.

—The tumor clinic of Michael Reese Hospital is sponsoring a graduate course on tumors during the week September 21-27. Morning sessions will be held at the Palmer House and afternoon sessions at the hospital, except those of Wednesday September 23, which will be at the Veter-

ans' Administration Facility, Hines, Ill. Subjects and speakers are as follows: Monday, symposium on cancer of the breast, with Sir George Lenthal Cheatle, London; Dr. Henri Coutard, Paris, and Dr. Max Cutler as speakers; Tuesday, intra-oral cancer, Dr. Coutard and Dr. Cutler; Thursday, pelvic tumors, Dr. Coutard and Dr. Cutler; Friday, causes of cancer, Sir G. Lenthal Cheatle, and biopsy, Dr. Cutler; Saturday morning, high voltage x-rays, Arthur H. Compton, Ph.D., professor of physics at the University of Chicago; Gioacchino Failla, Ph.D., physicist of Memorial Hospital, New York, and Dr. Coutard. The Wednesday session at Hines Hospital will consist of clinics in which cases of interest from the cancer service of the hospital will be presented. Friday afternoon there will be demonstrations at Michael Reese of radium treatment of cancer of the cervix, insertion of radium needles, construction of radium molds and transillumination of the breast. In the evening there will be a banquet at which Dr. Morris Fishbein, editor of *The Journal, A. M. A.*, will be the speaker. Sunday will be devoted to informal round table conferences.

—Dr. Maurice B. Visscher, since 1931 professor of physiology, University of Illinois College of Medicine, has resigned to become head of the department of physiology and physiologic chemistry, University of Minnesota School of Medicine, Minneapolis, effective September 1. His successor at Illinois has not been announced. Dr. Visscher was a member of the teaching faculty at Minnesota from 1922 to 1925, when he took the degree of doctor of philosophy. He received the medical degree at Minnesota in 1931. He was a fellow of the National Research Council at University College, London, 1925-1926, after which he went to the University of Chicago. He served as associate professor of physiology at the University of Tennessee School of Medicine from 1927 to 1929 and of physiology and pharmacology, University of Southern California, 1929 to 1931, when he was appointed at Illinois.

—A lobby window in the Annex Building of Marshall Field and Company has been given to the Chicago Medical Society, free of rental and service charges, for the display of health educational material. The exhibit now on display is a moving, electrically lighted model showing the circulatory system, lent by the University of Illinois College of Medicine. The background of the window is an allegorical painting representing figures of heart disease, pneumonia, cancer, nephritis and tuberculosis. There is also a card in the window giving the number of deaths from these diseases in Illinois during the first four months of 1936 as reported by the state department of health. The first exhibit, presented early in July, was on eye injuries, especially those caused by Fourth of July accidents. The displays are planned and prepared by the educational committee of the Illinois State Medical Society.

Deaths

WILLIAM ALEXANDER BUCKNER, Chicago; Harvey Medical College, Chicago, 1900; aged 72; died, May 6, of carcinoma of the prostate and lobar pneumonia.

ANNA REBECCA COOPER, Chicago; Cleveland Medical College, 1895; aged 65; died, May 2, in the Provident Hospital, of coronary occlusion and pulmonary infarct.

FRANK MCCOLLUM COX, Chicago; Hering Medical College, Chicago, 1901; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1909; aged 59; died, May 8, in the Augustana Hospital, of myocarditis.

ALEXANDER L. DAVIDONIS, Chicago; Chicago Medical School, 1922; aged 40; died, May 21, of coronary thrombosis.

LEWIS JOHNSON DAY, Chicago; Chicago College of Medicine and Surgery, 1910; aged 65; died, May 31.

JACOB FRANK, Chicago; University of Buffalo School of Medicine, 1882; past president of the Chicago Medical Society and the Chicago Surgical Society; retired colonel, Illinois National Guard; served during the World War; consulting surgeon to the Grant and Columbus hospitals; formerly surgeon to St. Elizabeth's Hospital; aged 80; died, August 11.

JOSEPH L. KORZEN, Berwyn, Ill.; Chicago College of Medicine and Surgery, 1917; aged 49; died, May 6, of coronary thrombosis.

JAMES MCDOUGLE, Humboldt, Ill.; Rush Medical College, Chicago, 1877; aged 83; died, May 13, of cerebral hemorrhage.

PAYSON LA VERN NUSBAUM, Chicago; Northwestern University Medical School, Chicago, 1911; fellow of the American College of Surgeons; served during the World War; associate in gynecology at his alma mater; aged 57; on the staff of the Wesley Memorial Hospital, where he died, July 28.

FRANCIS W. WILLARD, Chicago; Marion-Sims College of Medicine, St. Louis, 1891; also a dentist; aged 70; died, May 14, in the Frances E. Willard Hospital, of diabetes mellitus and acute dilatation of the heart.

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